ACTION TRACK 5 – BUILDING RESILIENCE TO VULNERABILITIES, SHOCKS & STRESS

Synthesis Report
Potential Game Changing and Systemic Solutions
an Initial Compilation

As of February 19th, 2021

DISCLAIMER:
This paper presents merely an initial set of ideas submitted to the UN FSS Secretariat by Action Track 5 (i.e., the first 'wave' of ideas). Additional solutions will continue to be developed over the coming months, in close collaboration with all relevant stakeholders including national governments. 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 5 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 5 members or their institutions.

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1 INTRODUCTION

This Synthesis Report presents an initial preliminary set of proposed ideas for "game-changing" and systemic solutions to achieve the goals of the UN Food Systems Summit Action Track 5 (AT5) of *Building Food Systems' Resilience to Vulnerabilities, Shocks and Stress* (see below).

OBJECTIVES OF ACTION TRACK 5:

The resilience of food systems demands a comprehensive approach that integrates responses to climate change, biodiversity loss, conflict, epidemics, economic crises, food insecurity, malnutrition and considering poverty, inequalities and poor land use and distribution as structural root causes of increased hunger.

The **General Objective of Action Track 5 (AT5)** is to "**Build Resilience to Vulnerabilities, Shocks and Stress.** AT5 actions aim to ensure that food systems which are affected by conflict, climate, environmental, natural, health and economic shocks and stresses, can anticipate, maintain functionality, recover, and improve to a better-off state. These actions include a focus on "productive disruption" in the context of global crises, such as pandemics[1], biodiversity loss and the global climate emergency.

AT5 focuses on integrated and cross-cutting system and nexus approaches to reduce vulnerability to compounded risks, structural fragility and systemic causes, on risk reduction, and on multi-risk and crisis management across and within Food systems.

Definition of Resilience used by AT5. "*The ability of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all*"[2] (UN Common Guidance, 2020)

[1] Note: In light of these challenges, it is important to note that the ongoing pandemic has given this action track an opportunity to investigate integrated solutions to build greater resilience within the current food system across the full value chain from production to end-life, and plan for a more resilient future food system.

2 UN Common Guidance on Helping Build Resilient Societies, 2020.

SPECIFIC OBJECTIVES OF AT5

Objective 1.
Strengthening economic, social, and environmental foundations in a manner that guarantees food systems resilience, food security and nutrition for all, while stewarding healthy ecosystems for current and future generations. Building resilience requires that people, institutions, infrastructure, services of the Food Systems have the capacity to anticipate shocks, manage risks; prevent (reduce exposure), absorb (respond to and cope), adapt to an evolving risk scenario, or transform when the current food system is no longer economically, socially and environmentally feasible.

Objective 2.
Guaranteeing that **all people within a food system are empowered and entitled** to plan for, withstand, and recover from instability. Special attention shall be given to ensure the interventions are ethical, equitable, participative, based on human rights -principles, and take into consideration human capabilities at individual, household and community level. Human resilience at individual level is based on adequate health and nutrition, adequate and timely access to knowledge, access to assets (financial, physical, natural, social, human), human rights fulfilment, empowerment (adequate voice and agency), and capabilities to live a decarbonized life.

Objective 3.
Ensuring the **functionality and resilience of food systems in areas vulnerable to systemic and multiple hazards risks and stressors** (e.g. climate extremes, disasters, conflict, instability, economic shocks, pandemics) requiring urgent global and coordinated action. In these fragile settings it is critical to reduce vulnerability to compounded risks, structural fragility and systemic causes. This calls for a systemic approach that integrates approaches such as Water-Food-Energy Nexus, HDP Nexus, or the One/Planetary Health, and optimizes joint area-based interventions including solutions to climate change, biodiversity loss, conflict, epidemics, economic crises, food insecurity and malnutrition. Structural root causes of increased hunger and poverty, such as inequalities, poor land access and distribution, or gender disparities and human rights violations should also be taken into consideration.

Objective 4.
Fostering and enabling **the broad participation and co-governance of food systems by all people.** Participation, co-creation and access to open knowledge are enabling principles to foster a tricentric governance where enabling states, social markets and collective actions may thrive, thus contributing to strengthen food systems. Resilient food systems need to deliver food security, nutrition, and equitable livelihoods for all within planetary limits and above social floors, and that can only be achieved with people at the at the steering wheel, bottom-up and based on communities.

Drivers of fragility / food crises addressed by AT5

- Conflict, instability
- Climate/Environmental extremes
- Natural Adverse events
- Economic shocks
- Pandemics & pests

Realms of intervention

- Institutional
- Ecosystem - Landscape/Seascape
- Community
- Household
- Individual

ACTION TRACK 5 STRUCTURE

AT5 on Resilience is anchored in World Food Program (WFP) and has set up a leadership team and a Scientific Group that helps to identify and develop systemic and game-changing solutions to Build Food Systems' Resilience to Vulnerabilities, Shocks and Stress. The work is divided into five working groups and cross-cutting thematic areas focused on Human Rights, Gender, finance, and innovation.

PROCESS FOR IDENTIFYING AND DEVELOPING GAME-CHANGERS

A survey was developed as a way to collect ideas for potential game-changing and systemic solutions to ensure environmental resiliency, economic resiliency and social resiliency in food systems.

This survey, available online was first set up to invite stakeholders and members of the public to submit their solutions. The survey was shared broadly through the UN Food Systems Summit online community space, with Member States as well as, through targeted outreach to large networks and multi-stakeholder platforms outside the Summit, with an initial deadline of January 30th to receive inputs. To complement the survey, the AT5 leadership team also circulated a call for proposals as Word documents, to allow more space to develop and submit more in-depth submissions, in particular for Member States. These papers are listed in a Master Table.

The Action Track 5 (AT5) expert group was divided into five workstreams and Working groups:

- **Environmental Resilience Working Group (ENVI)**
- **Social Resilience Working Group (SOC)**
- **Economic Resilience Working group (ECO)**
- **Peace Building (F)**
- **Cross-cutting solutions Working Group (CC).**

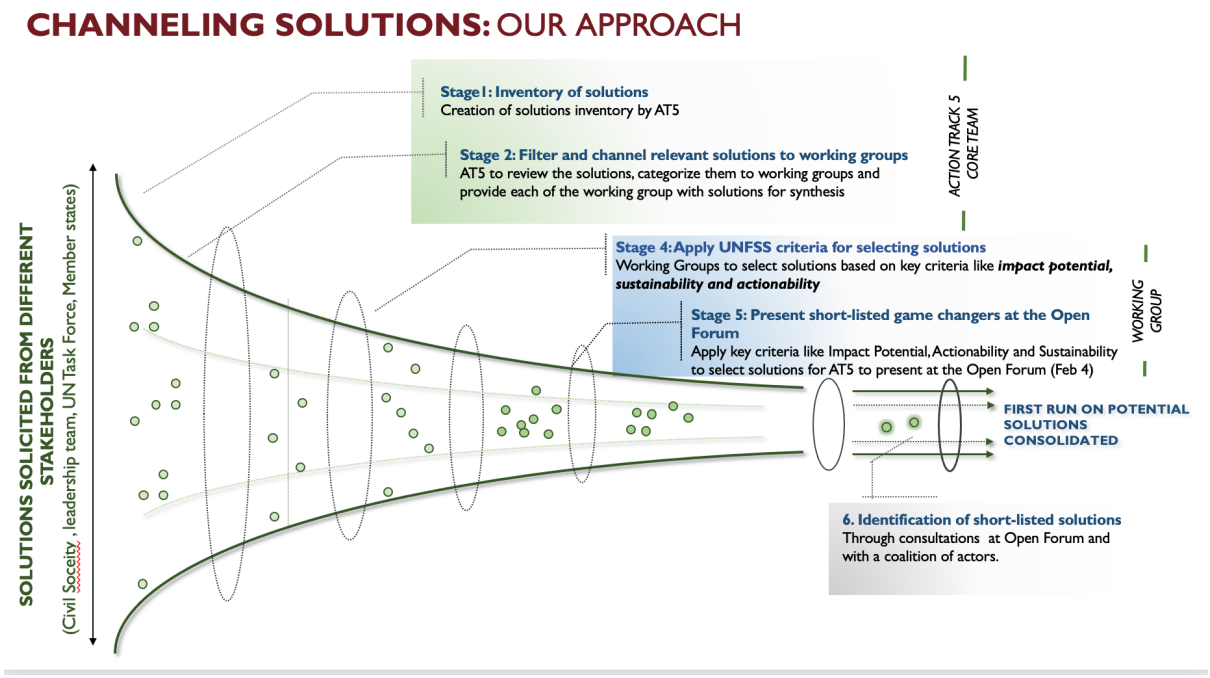
The Working Groups themselves were invited to generate and submit game-changing solutions to enrich the process.

As a second step, all the solutions were reviewed and assessed through the UN Food Systems Summit common criteria of Sustainability, Actionability, Scalability, as well as, the additional filters relevant to the resilience tracks (see below the full description of the step-wise approach).

- **Impact**: provides long-term economic, environmental and societal value at scale, addresses the main and most urgent challenges facing food systems production and has synergies (and no/low trade-offs) with other actions and sustainable food systems already in place.
- **Actionability**: are designed to target a specific area of improvement, specifies the measurable outcomes, accounts for the given situation and resources to make sure the solutions are feasible to implement, and declares accountability for achieving the outcomes.
- **Sustainability**: has the ability to keep delivering to 2030 and beyond.

The solutions were then channeled through the various Groups to facilitate their review, although many of them are cross-cutting and cover several aspects of resilience. The Working Groups then prepared a short list of solutions and consolidated them by writing a 2 pager for each of them.

See the diagram below for AT5 approach and methodology:



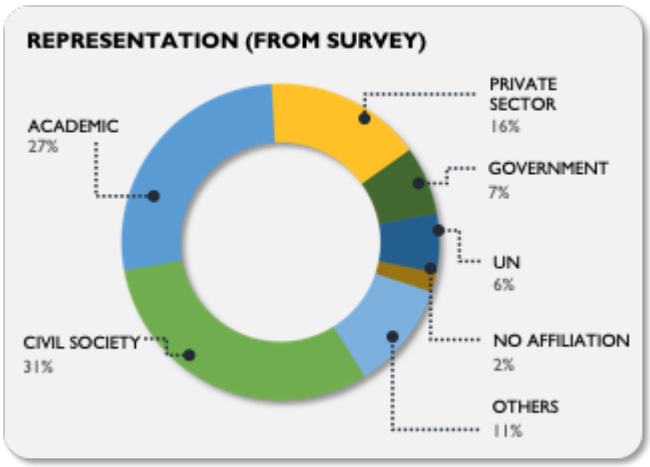
The Working Groups were also invited to select a short-list of 5-6 solutions maximum, with the objective of selecting 20-25 Game-Changing Solutions, and with the option of aggregating and consolidating some of the Solutions under the same heading to facilitate some potential partnership building.

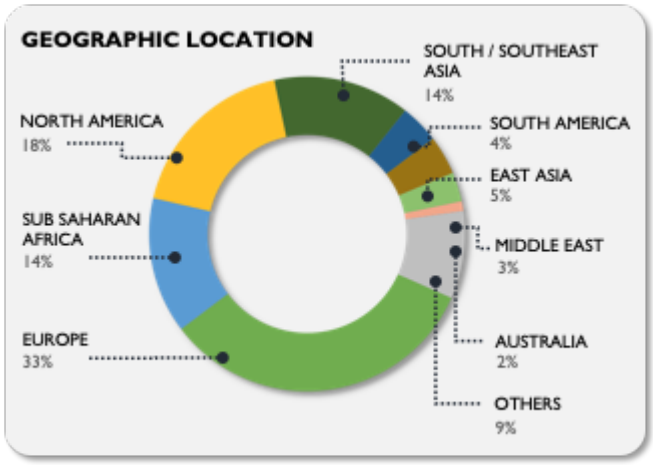
Many of the proposed solutions were also being submitted to the other Action Tracks, therefore AT5 facilitated cross-fertilization meetings with the other Action Tracks to start identifying overlaps and synergies, further streamlining the solutions identified by the Working Groups, and referencing the submissions that could be grouped under each heading at a later stage.

2 STATISTICS AND INITIAL REVIEW OF THE FIRST ROUND OF SOLUTIONS

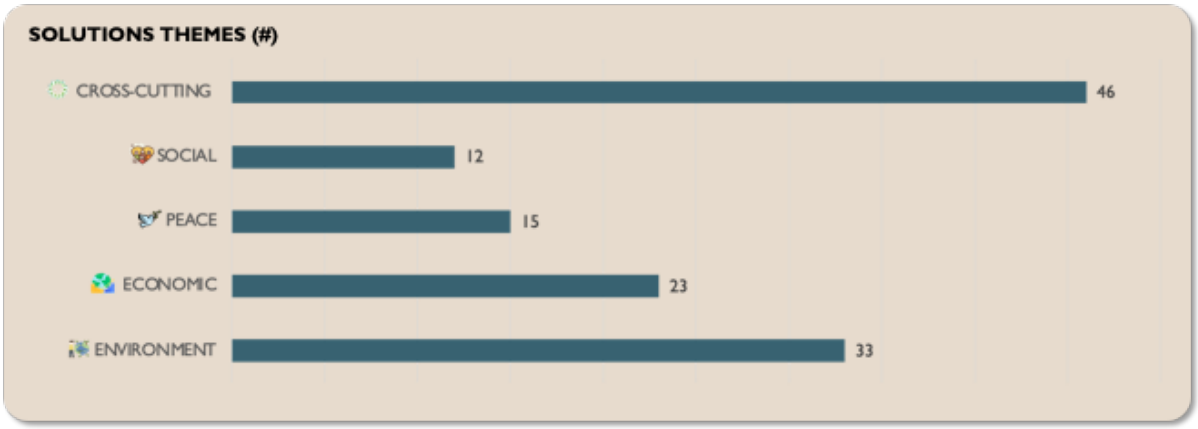
More than 132 responses were received through the open call for solutions. They cover a full range of actors, a broad geographical coverage, a variety of scales, a good diversity of thematic areas as well as various types of actors (see the pie charts presented below).

The types of proposals vary greatly. Some describe policy and finance changes, levers of change, others present some very local and practical best practices at the project level. The solutions will need to be optimized with other solutions within the resilience framework we have applied and taking into consideration nexus and systems dynamics. Further work will be necessary to ensure proper depth and impact application as we move into the final phase of selection.





Each of these solutions were channeled to the 5 working groups with number of solution breakdown for each working group as below:



3 INITIAL SHORT-LIST OF GAME-CHANGING SOLUTIONS

The following sections present the solutions that were selected in the first wave (from an initial sample of 132 individual solutions assessed). Based on the initial screening and review processes undertaken in the five Working Groups and the AT5 Core Group, 25 solutions were elevated to the AT5 leadership group. Each solution was assessed based on two-pagers that were prepared following a pre-determined outline.

For each solution there is a brief explanation of what it is, the problems it is addressing, and how it would affect change, then explain why it aligns to the Summit's 'game changing and systemic solution' criteria, and finally discuss potential political support and contexts for its implementation.

METHODOLOGICAL DISCLAIMER:

These lists are a work in progress and they just reflect the first wave of the assessment and an initial set of potential solutions. The solutions presented here will continue to be refined, developed further, and contextualised through active engagement with diverse stakeholders, including member states. Only a few countries were able to submit solutions to this first wave and therefore most of the country solutions have not been integrated in this initial selection process.

There has been a call for clustering in order to reduce the multiple solutions to manageable packages where coalitions can be formed and concrete pathways for implementation can be identified. Further in the process, trade-off, synergies, lock-ins and scalability issues will be assessed on a package-by-package basis.

Additional workstreams on "governance and institutional architecture" and "ethics, principled debates and narratives of transition" shall be proposed in the "thematic packages" so as to incorporate the contributions from the four levers of change (gender, human rights, finance and innovation).

4 SYNTHESIS LIST PREPARED BY ACTION TRACK 5

SOLUTION 5.1: FOOD AND PEACE FACILITY IN COUNTRIES FACING THE RISK, REALITY OR AFTERMATH OF A CONFLICT-RELATED HUMANITARIAN CRISIS

A multidisciplinary hub made up of humanitarian, development and peacebuilding analysts, actors and funders in a country that faces the double burden of hunger and conflict.

What, in brief, is the solution?

A Food and Peace Facility is a multidisciplinary hub made up of humanitarian, development and peacebuilding analysts, actors and funders in a country that faces – throughout the country or in a part of it – the identifiable risk, current reality or aftermath of violent conflict and its humanitarian impact. The Facility houses the capacity to develop, plan and carry forward activities that address and ameliorate the double burden of food insecurity and conflict. It houses teams that bring together discreet and disparate initiatives and ways of working to exploit the synergies between them. It integrates and amalgamates existing and new activities. It ensures a nuanced, coherent, comprehensive and systematic approach to strengthening sustainable food systems so that, to the greatest extent possible, efforts to strengthen food systems are conflict-sensitive and peace positive.

A Food and Peace Facility shapes the strategy and actions that build food security and peace in the country, and shapes incoming funding streams to ensure they are appropriate to meeting those goals in the specific context. Donors support the Facility to give it authority and weight and the Facility's capacity ensures it has impact and influence. Each facility is a point of consolidation and cross-learning.

It is of the essence of this proposal that each Facility contributes to preparedness and prevention, as well as response and recovery. Each Facility will therefore contribute to the fundamentals of resilience.

Each Food and Peace Facility:

- Provides context-specific multidisciplinary analyses on the complex relationships between food systems, livelihoods, climate change and violent conflict with policy recommendations;
- Increases awareness of these relationships at the local, national and regional levels;
- Promotes coherent and coordinated food system planning that incorporates these relationships;
- Thus, promotes a range of individual actions that are designed for and appropriate to the specific contexts in which they are to be implemented;
- Monitors actions and lessons learnt, thus improving programming;

- Conducts detailed conflict analyses with policy recommendations for government agencies, national and international non-governmental organizations, and UN organizations (taking into consideration the needs of girls, boys, men and women);
- Brings together and, where necessary, ensures the collection of contextual data, including biophysical, agro-environmental, weather patterns, climate predictions, food and nutrition security, geo-political data and conflict trends to inform scenarios of food system fragility and impacts, and to feed early warning systems;
- Scales-up food security, livelihoods, climate resilience, and early warning activities proven to contribute to the prospects of peace, and scales-up peacebuilding interventions proven to strengthen food security, livelihoods, and climate resilience;
- Facilitates coherent practice and cross-learning among UN organizations, national and international NGOs, government institutions and local organizations;
- Informs, where appropriate, inter-agency processes in the country or region, including Humanitarian Response Plans, Regional Refugee Response Plans, UN Sustainable Development Cooperation Frameworks (UNDCF) and World Bank Cooperation Frameworks and Preparedness Plans, etc.;
- Assists with food security preparedness planning of governments, where appropriate (particularly those done in conjunction with the World Bank);
- Works with the private sector to establish sustainable food security, livelihoods and climate resilience interventions that contribute to improving the prospects for peace and sustainable peacebuilding interventions that strengthen food systems, livelihoods, and climate resilience;
- Fundraises for evidence-based interventions that strengthen food security and improve the prospects for peace.
- Promotes the on-the-ground implementation of existing frameworks that underscore the relationship between food insecurity and violent conflict, particularly the Committee on World Food Security's (CFS) Framework for Action for Food Security and Nutrition in Protracted Crises.

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

The solution emerged from a member of the working group and was developed following discussion with all working group members. It also includes components of suggested game-changing solutions submitted in a survey of AT5 members.

The solution draws upon recommendations noted in, inter alia, the 2017 *State of Food Security and Nutrition* report, the 2017 FAO study, *Sowing the Seeds of Peace for Food Security: Disentangling the nexus between conflict, food security and peace*, the 2018 UN and World Bank report, *Pathways for Peace: Inclusive Approaches to Preventing Violent Conflict,* CGIAR Climate Security webinars on a *Partnership Agenda for Climate Security*, and SIPRI's 2019 *The World Food Programme's Contribution to Improving the Prospects for Peace* report, published as part of the SIPRI-WFP knowledge partnership (see section 2.7 for more details).

What problem is it trying to address within food systems?

Despite ample evidence that violent conflict gravely weakens food systems and is the leading driver of food insecurity, scientific perspectives, as well as interventions designed to strengthen food systems, support livelihoods, and mitigate the impacts of climate change often overlook conflict dynamics, as well as the root causes of violent conflict and food insecurity. Such interventions therefore risk having a limited impact and exacerbating existing fragilities.

How can this solution address that problem?

Theory of Change: If peacebuilding, food security, livelihoods, climate resilience, and early warning interventions are evidence-based, integrated and managed by a dedicated institution in each conflict-affected country, then peacebuilding efforts will strengthen sustainable food systems and food systems will enhance the prospects of positive peace.

Inputs:

- An active network of humanitarian, development and peacebuilding actors in country;
- Donor government support;
- Tools to ensure that efforts to strengthen food systems are both conflict-sensitive and peace positive, and that peacebuilding activities ensure strong and sustainable food systems, including:
    - Detailed conflict analyses;
    - Nuanced and context-specific analyses on the root causes of food insecurity and violent conflict;
    - Thorough integration with land/water/food systems and climate change scientific research;
    - Guidance on effective impact measurement, assessment and evaluation.

Outputs:

- Effective and well sequenced programmes that enhance both food systems and peace, and reduce risks of food insecurity and conflict;
- Coalitions and cross-learning among actors;
- Greater knowledge of what works.

Outcome:

- More impactful and sustainable peacebuilding, food security, livelihoods, climate resilience, and early warning interventions;
- Increased awareness of the relationship between strong, sustainable food systems and positive peace;
- Improved understanding of the impact of peacebuilding interventions on food systems, and of food system interventions on the prospects of peace;
- Scaling up of food security, livelihoods, climate resilience, and early warning activities proven to contribute to the prospects of peace and of peacebuilding interventions proven to strengthen food security, livelihoods, and climate resilience;
- Coordinated and more effective fundraising for activities proven to contribute to the prospects of peace and sustainably strengthen food systems in conflict-affected areas.

Impact:

- Stronger, more sustainable food systems;
- Positive peace in previously conflict-affected areas.

Assumptions:

- National governments and regional bodies of conflict-affected countries and regions will allow for the establishment of a Food and Peace Facility, and will permit the facilities to carry out their work unimpeded;
- Facilities may face political resistance as they will highlight drivers of fragility, such as poor governance, poor economic performance, uneven national allocation of resources, disenfranchisement, erosion of human rights, etc.;
- Facilities will not lose political buy-in with changes in governments;

- Key actors will be ready to integrate their networks, fixed assets and regional presence to support the emerging of these facilities;
- Donor governments will provide sustainable, long-term funding for Food and Peace Facilities;
- Scientific, humanitarian, development and peacebuilding actors will work together effectively, and will consolidate or amalgamate activities, where appropriate;
- Actors will incorporate analyses and measurement indicators in their interventions.

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

By consolidating and amalgamating existing interventions across the HDP nexus, Food and Peace Facilities allow for cross-learning, which will magnify the impact of interventions and ultimately ensure a high return on investment. Serving as multidisciplinary hubs, the Facilities are flexible and rely on existing actors and ongoing work, meaning that – with long-term funding – they are a sustainable and nimble solution. Moreover, by including humanitarian, development and peacebuilding actors, the Facilities will ensure that interventions across all Action Tracks are sustainable and effective in conflict-affected and at-risk settings.

Food and Peace Facilities are a true departure from the current siloed approach of working in conflict settings, as they ensure that peacebuilding activities strengthen food systems and that food system interventions contribute to the prospects of peace. By involving local, national, regional and international actors, the Facilities will also build consensus on the context-specific relationship between food insecurity and violent conflict, helping to eliminate the economic and political self-interest of actors from interventions.

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 need for conflict-sensitive approaches and greater conflict analysis is clearly stated in all three publications noted in section 2.2. The FAO published *Sowing the Seeds of Peace for: Disentangling the nexus between conflict, food security and peace* further stresses the need for action across sectors and by multiple actors to address the relationship between land, water and food security with peace.

SIPRI's preliminary research on WFP's programming highlights the need for a holistic approach that accounts for the complexity of networks and relationships, particularly in conflict settings. It also emphasizes the need for partnerships across sectors and disciplines to better understand and respond to this complexity. Lastly, it stresses the importance of ensuring that food security actors systematically and effectively measure their contributions to the prospects of peace.

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

Many countries, regional and international bodies are likely to support this idea. These include:

- **The Netherlands, Côte d'Ivoire, Kuwait,** and **Sweden** – penholders of UNSCR 2417, which highlights the relationship between war and hunger.
- **Denmark**, who funds the SIPRI-WFP knowledge partnership, which focuses on improving the evidence base for the relationship between food and security.
- **Member states of the Committee on World Food Security (CFS),** which endorsed, in 2015, the Framework for Action on Food Security and Nutrition in Protracted Crises (CFS-FFA).
- **Member states of the Global Network Against Food Crises,** whose objective is to "improve coordination and integration of actions along the Humanitarian-Development-Peace nexus for long lasting solutions to food crises".

- **Member states of the OECD Development Assistance Committee (DAC)**, whose 2019 *Recommendation on the Humanitarian-Development-Peace Nexus* notes the importance of "coherent and complementary coordination, programming and financing of humanitarian, development and peace actions".
- The **Intergovernmental Authority on Development (IGAD)**, whose *2020-2022 Food Security and Nutrition Response Strategy* recognizes the adverse impact of conflict-induced shocks on food security.
- **Member states at the System Board and the General Assembly of Centers CGIAR**
- UN organizations and NGOs working on issues related to land/water/food security or violent conflict

The **World Bank** in particular may support this solution given their ongoing efforts on the Famine Action Mechanism, the Crisis Response Window- Early Responses to Slower-onset Events (CRW-ERF) and the Early Warning for Early Action hub focused on integrated food security monitoring . Synergies and areas of collaboration with the World Bank's work should be explored to amalgamate efforts, where appropriate, and avoid duplication.

CGIAR (the Consultative Group on International Agricultural Research) has already indicated support, including the willingness of its member organizations to play an active role in this solution.

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

A Food and Peace Facility should be established in every country or region (when there are clear linkages between food and conflict challenges experienced by neighbouring countries) affected by risk, reality or aftermath of violent conflict. Fragile contexts, including post-conflict settings experiencing negative peace, are also well suited for Food and Peace Facilities.

What do you think are the key actions required to address this solution? Please mention the implementation approach for 3 levels, if appropriate:

Buy-in is required at three key levels to ensure the establishment and long-term success of Food and Peace Facilities:

a. National and regional:
- To counter potential political resistance, as well as ensure sustainability and effectiveness, each facility should ensure political buy-in and ownership at national and regional levels.
- Regional bodies (e.g. African Union, ASEAN, CELAC, etc.) should promote facilities with their respective member states to ensure national buy-in. This could potentially be facilitated, where appropriate, through a specific mechanism developed by the regional organization.

b. Donors:
- Long-term, sustainable funding is required to ensure the success of this solution.
- Where appropriate, the findings and recommendations of the facilities should inform other donor decisions made in the country or region.
- National governments and regional bodies should also be encouraged to provide funding to deepen their ownership of facilities in their country/region.

c. Local and international actors working across the humanitarian-development-peace nexus
- Scientific, humanitarian, development and peacebuilding actors must work together effectively, and consolidate or amalgamate activities, where appropriate.
- Actors should incorporate analyses and measurement indicators in their interventions.

SOLUTION 5.2: STRATEGIC FOOD RESERVES TO SMOOTH CONSUMPTION SHOCKS

Building resilience in shock-prone areas to stabilize prices, build safety nets for temporary assistance to affected communities, and/or boost national social protection systems.

What problem is the solution trying to address?

The key challenge is food availability and price volatility during poor harvest periods and in shock-prone areas (natural, economic or health-related shocks). In times of shock, the length of time it may take to trigger and organize food deliveries is highly dependent on political, social and economic factors – risking delays in supporting people and communities.

Extreme price volatility in times of food shortage can lead to medium and long-term economic challenges, damage health and nutrition (and long-term well-being), and lead to negative coping mechanisms that reduce the productive capacity of individuals after the shock.

What, in brief, is the solution?

Strategic and emergency food reserves to smooth consumption shocks and achieve development objectives including resilience.

Effective food reserves (leveraging early warning systems and good governance protocols) can be a tool for governments, supported by development partners, to stabilize prices, build safety nets for temporary assistance to affected communities, and/or boost national social protection systems. Strategic and emergency food reserves strengthen government preparedness in emergencies and enable governments to maintain expenditure levels in health and other sectors during periods of short-term food shortages and shocks.

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

World Food Programme

How can this solution address that problem?

Strategic and emergency food reserves are part of the toolbox of solutions that support resilience building before, during and after shocks. It addresses the risks and consequences of delays in supporting shock-affected areas as well as supplementing food availability in periods of low harvest to prevent spikes in staple crop prices.

Through capacity strengthening of government and partners in:

a. Market intelligence - Market monitoring, forecasting
b. Governance - Rules/SOPs for market interventions based on objective market intelligence, leadership, management, accountability and transparency in allocation
c. Supply chain management - Procurement planning and contracting, storage, post-harvest handling and quality control, distribution logistics
d. Linkages with food assistance/social protection programmes - establishment of rules/SOPS for the use of food as a safety net for temporary assistance to affected populations
e. Linkages with value chain development and smallholder support - pro-smallholder contract modalities, value chain analysis, capacity strengthening of local smallholder farmers and other value chain actors
f. Procurement of food for the reserve can be leveraged to support targeted local value chains and support targeted smallholder farmers, leveraging the activity for development objectives
g. During a shock:
h. Food will be released in the market in a strategic manner based on market intelligence

i. Temporary food assistance programmes and government social protection systems can access food as transfer modality in times of crisis (in place of cash)

Resulting in:

1. Increased availability of food and price stability in times of crisis, resulting in improved food security and nutrition of local consumers
2. Increased food security and nutrition of households targeted in food assistance programmes
3. Improved livelihoods of targeted smallholder farmers
4. Increased efficiency and effectiveness of local value chains

Key risks and assumptions:

- Inadequate release of food on local markets can create market distortions and affect local value chains
- Food reserves might be exposed to government preferential allocations that will affect its management and decision-making processes; these preferential allocations can omit some areas of need which will result in vulnerable people exposed to further food insecurity.
- Inadequate supply chain management can result in food loss
- Human and technical capacity needs to be strengthened for management and storage

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

When implemented transparently and in alignment with early warning systems, the solution has the potential to mitigate the impact of a temporary shock (economic, natural, conflict) and considerably reduce the negative impact on the livelihoods, food security and nutrition of all consumers in the affected region. During the 2008 Financial crisis, FAO found that countries with strategic food reserves were better equipped to weather the resulting social and economic shocks.

Food reserves are one of the tools to build in community resilience ahead of shocks, rather than responding to them after the fact.

Further, the approach can be leveraged to support the implementation of food assistance/social protection programmes, as well as to promote local value chain development and smallholder income (through preferential sourcing).

The solution can be linked to the AT5 objective of not only stabilising the peace in fragile states and regions but also during pre and post-conflict periods. Food shortage is one of the causes of social unrest and threatens the peace in post-conflict countries.

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

Several member states are currently managing Food Reserves, even though the management of some might be sub-optimal, and they may not leverage all synergies mentioned in this GCI, in terms of value chain development and linkage with social protection programmes.

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 is particularly suited in contexts that are prone to recurring (natural, economic or man-made) shocks – such as areas of persistent drought where both basic grain reserves and purchasing power are low.

Food reserves are not appropriate in all contexts. For example, the cost-benefit ratio may not be ideal in situations where markets are functioning, and stakeholders are able to reliably purchase food nationally or

internationally. However, international purchases tend to be less accessible in times of conflict, currency crises or collective crises (such at the 2008 food price crisis where several individual state actions led to a collective "beggar thy neighbour" economic policies), leading food reserves as a viable option for some states.

What do you think are the key actions required to address this solution? Please mention the implementation approach for three levels: public policies, corporate actions and civil society actions:

Key actions required for this solution include:

- Public policies and legal provisions defining the conditions of use of the emergency food reserves, as well as the key principles in governance and decision-making
- Investments in associated infrastructure and equipment (warehouses, quality control, transport, etc.)
- Capacity strengthening of staff in key areas of reserve management. Technical support and training to build up local experts in building and maintaining storage facilities. Different crops require different storage conditions and these storage conditions should be maintained adequately and regularly so that there is no loss/deterioration of crops' value.

Civil Society actions: monitoring and governance, contributing to early warning systems, supporting the release of food reserves to target groups.

Establishment of partnership with development partners and private sector value chain actor for the promotion of local value chains

SOLUTION 5.3 NUTRITION SENSITIVE SOCIAL PROTECTION SCHEMES

Schemes supported by public policies and budgets, based on social contracts between the State and the citizens, implemented through diverse schemes

What problem is the solution trying to address?

The impact of a shock, whether caused by conflict, climatic, economic or political disruption always hits hardest those who are least able to cope. Individual financial resilience plays a critical role in determining whether people can cope, or whether they are required to make unsustainable demands on their assets, in turn incurring lasting impacts on their ability to recover. Financial resilience is also a critical factor in securing and sustaining access to nourishing food, protecting people from undernutrition, as well as diet related disease. Expenditure on food is often sacrificed in order to meet other forms of essential expenditure (e.g. housing costs or protection of assets) but this incurs immediate impacts on the health and wellbeing of household members, particularly those who have elevated nutritional needs.

As a result of the pandemic, the numbers of people experiencing acute hunger is estimated to have risen from 135million to 265million (ref) and inequalities in many countries (whether high, middle or low income) have widened. Yet even before the current crisis, poor diets linked to low income were evident in most countries of the world. Vast schemes have been operationalised by governments and charities across the world to respond to this crisis. Their success in protecting people from the impact of the pandemic is likely to have been closely dependent on the strength of the social protection system in place before the crisis hit.

What, in brief, is the solution?

Nutrition sensitive social protection schemes- These are long term programmes, funded by national budgets, which aim to strengthen the resilience of households to low or fluctuating income and help them to secure sufficient, nourishing food on an ongoing basis. By adopting a cash first approach these schemes support local markets with knock-on impacts on local economies, and empower recipients to use their resources in the best possible way to meet their current and future needs. Schemes can be designed to target groups of the population with elevated nutritional needs (e.g. children, pregnant or breastfeeding women, older people), or delivered in a manner which supports recipients to prioritise spending on nutritious foods (e.g. using conditionality or vouchers).

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

Survey form

How can this solution address that problem?

Nutrition social protection schemes require, in the first instance, political support. This requires political elites to be connected with citizens who experience food insecurity and to understand the reasons behind their situation. In many instances political elites are disconnected from citizens and popular narratives about the deserving and undeserving poor are rife. A critical element of the process of establishing social protection schemes should be hearing directly from people who are food insecure and consulting them on the optional design of the schemes.

These schemes require substantial financial support. The case for financial support often hinges on whether a case can be made for the schemes to have a long term impact on productivity by building human and economic capital. A range of approaches have been used by governments around the world. These include: (i) re-allocating public expenditures; (ii) increasing tax revenues; (iii) expanding social security coverage and contributory revenues; (iv) lobbying for aid and transfers; (v) eliminating illicit financial flows; (vi) using fiscal

and foreign exchange reserves; (vii) borrowing or restructuring existing debt and; (viii) adopting a more accommodative macroeconomic framework (see here). Schemes which place taxes on products which have high externalities (eg sugary drinks) may offer particular appeal for nutrition sensitive social protection. For example, in the UK the sugary drinks industry levy was used to finance breakfast clubs for children in deprived areas of the country.

FAO has developed helpful guidance on nutrition sensitive social protection here.

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

Social protection schemes are already operating in many countries of the world but they are not always aimed at protecting the diets of those at greatest risk of malnutrition. Their primary impact is on increasing human capital and these impacts have been shown to be delivered at scale.

It is important that national governments finance and design the schemes in order to ensure their sustainability and to ensure the political challenges are addressed at the outset.

Nutrition sensitive social protection become game changing when it can support citizens to shift to healthy and sustainable diets and can be designed alongside measures to realign food production, supply and manufacturing and retail (the food system) to meet this demand.

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

Long term financing of social protection requires defining the social contract between citizens and state. Many countries have social protection schemes already. The nature of the social contract varies and finance also varies (ref).

The extent to which schemes are designed with nutritional outcomes and human capital investment in mind varies. Few countries are designing these schemes as part of an ambition to shift towards healthy and sustainable diets.

Articulating the role which nutrition sensitive social protection plays in helping to ensure everyone can benefit from a diet which protects health, builds human capital and protects the natural environment will be important.

What do you think are the key actions required to address this solution?

These are clearly outlined here

SOLUTION 5.4: BLENDED FINANCING MECHANISM TO SMALL PROJECTS/INITIATIVES LOCALLY OWNED BY WOMEN AND YOUTH

Business services, project development, concessional loans, grants to locally owned gender and youth-sensitive incubation projects along agricultural value chain.

What, in brief, is the solution?

This proposed solution aims to design and implement funding mechanism structured as a blended finance mechanism providing a customized mix of Business Development Services, project development and finance structuring services, and financial products offering seed capital in the form of concessional loans, grants and reimbursable grants etc….to locally owned gender and youth sensitive incubation projects along agricultural value chain to increase local food production and diversification to strengthen the LFS in the LDCs and graduated countries.

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

UNCDF in partnership with the European Union under the 11th EDF and the Government of Uganda is implementing a five-year Programme referred to as the Development Initiative for Northern Uganda (DINU). The general objective of the Programme is to consolidate stability in Northern Uganda, eradicate poverty, food insecurity and under-nutrition and strengthen the foundations for sustainable and inclusive socio-economic development with focus on SDG 1, SDG 2 and SDG 5.

Why is addressing that problem important for achieving the goal of your working group?

As Women and youth are in the most important actors whose livelihoods are related to agriculture and land management, the game changing solution will increase and enhance the connection of those left behind to the food production and food diversification business. This will lead to connect women and youth to agricultural value chains, reduce hunger, and improve access to nutritious food.

What is the theory of change?

Food production in the territory is still commanded by men with less space for the most important part of the local population. Women and youth can seldom afford food production assets and thus cannot be connected to the food value chains either for staple or cash crops. The same left behind in the food production and consumption are not at all involved in the decision making process even more so to the local food system governance. The question is how to empower the most important asset for local food production to build strong and resilient food system.

Local Food System improving mechanism will relay on the following key partners and stakeholders to increase the contribution of territorial development thru adequate financing of food value chain investments

- Connect women and youth to the food value chains thru small and medium agribusinesses by ensuring i) access to financial products in the form of grants, reimbursable grants and guarantees to top up a financial requirement of women and youth led food security investments that contribute to resilience building and adaptation to climate change and ii) access to customized project development Business Development Services support, including post-investment support.

- Reinforce and strengthen local financial institutions and agricultural/ SMEs finance facilities by i) structuring targeted pipeline of de-risked project proposals properly prepared and developed to address a broader agribusinesses including women and youth farmers' associations, cooperatives and firms.

- Improve the capacity of Local governments i) to engage with the private sector and create a local business-friendly environment for the most important part of the community (Women and youth) for

better fiscal space expansion, ii) to improve their capacity to align public investments with gender sensitive and youth led private food production investments to improve complementarities and synergies for resilient food system and iii) connecting this most important part of the population to the food value chain in order to improve their own source revenue collection for better basic social service delivery and enhance food security

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

As the Summit aims to include innovative solutions, the Support to Local Agricultural Transformation Funding Mechanism will be a game changing solution that is effective and has existing empirical evidence and a pilot-level evidence of feasibility and plausibility. It has been tested and piloted in Uganda under a UNCDF EU funded program.

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

The approach is implemented as START (Support to Agricultural Revitalisation and Transformation) facility in partnership with Ugandian Private Sector Foundation and Uganda Development Bank.

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

UNCDF in partnership with the European Union under the 11th EDF and the Government of Uganda is working on this solution in the framework of the Development Initiative for Northern Uganda (DINU). The approach is implemented as START (Support to Agricultural Revitalisation and Transformation) facility in partnership with Ugandian Private Sector Foundation and Uganda Development Bank.

This solution can switch to simple and regular context where there is an enabling environment for private sector development.

SOLUTION 5.5 FINANCIAL INCLUSION TO SMALL-SCALE PRODUCERS THROUGH CLIMATE RISK PROFILING

Climate risk profiling (using AI) tailored local weather patterns & soil/agricultural practices to de-risk credit guarantee schemes and insurance by private banks and insurance companies, to enable smallholder farmers to get access to credit to improve production in Tanzania, Ghana, Uganda and Zimbabwe (WINnERS project, with MunichRE).

What problem is the solution trying to address?

Africa's population is projected to double by 2050, making the continent home to more than one quarter of the world's population. Food production on the continent will need to increase dramatically to accommodate such a population surge. This endeavour will become increasingly challenging as soil conditions deteriorate and extreme weather events become more frequent because of climate change. Providing African farmers with access to finance, building capacity in farmer organisations, strengthening the resilience of current supply chains and providing solutions for sustainable agriculture intensification are key to food security and job creation on the continent.

What, in brief, is the solution?

Bringing finance access to small holder farmers is the foundation for systemic transformation of Agri-supply chains. By providing access to finance we can place conditionality loans to build capacity and incentivise climate resilient practices at the farm level. This leads to a positive feedback loop that makes the cost of credit cheaper and ensures that the entire supply chain places importance on farm level climate resilience.

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

Submitted by member of WG (Dr. Tom Mitchell, Chief Strategy Officer, Climate-KIC)

How can this solution address that problem?

Climate-KIC launched the WINnERS agricultural supply chain de-risking programme in 2016 with the aim to improve the financial inclusion of smallholder farmers in the Global South and create more inclusive and resilient food supply chains across Africa and Europe. The core of this multi-funder programme consists of a climate service that utilises machine learning to create robust climate risk information for reinsurance and credit guarantees, which allows banks to provide loans to smallholders who have never been able to access credit before.

In collaboration with Munich Re, the world's largest reinsurance group, an integrated service has been successfully brought to market in Tanzania, where the WINnERS solution is currently supporting local banks and insurance companies to de-risk credit guarantee schemes and ultimately boost food production and security of the country.

The WINnERS systemic framework is currently providing financial access to over 25.000 farmers in Tanzania, allowing them to take a loan for the first time in their lives, and, importantly, using such funding to gain access to a more efficient production inputs. As documented by the randomized control trial, 90% of the farmers covered by the product could not otherwise have had access to finance.

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

The WINnERS programme fits the main criteria as follows:

- Impact potential at scale: the scheme is already active in 4 countries (Tanzania, Ghana, Uganda, Zimbabwe) and covers 25,000 farmers in Tanzania alone. Climate-KIC plans to scale to include 10 new countries and support the financial inclusion of 1 million smallholder farmers by 2022.
- Actionability (taking into account politics, capacity, costs): 90% of farmers covered by the scheme could not otherwise have had access to finance
- Sustainability: this solution will be increasingly needed to support smallholder farmers that are facing the consequences of climate change. Governments could consider the inclusion of such solution into their agriculture/rural national plan for sustainable agriculture and food security.
- The African Development Bank is already supporting the scaling of the WINnERS scheme in Tanzania and beyond, with 3 new pilots launched in Uganda, Ghana and Zimbabwe.

The WINnERS scheme aims to build more inclusive and gender-sensitive farmer organisations. Currently, part of the programme's funding is specifically earmarked to promote gender equality and improving the financial inclusion of woman farmers in agricultural supply chains in Tanzania.

By bundling insurance with input loans, the product turns insurance into a credit enhancement device overcoming standard frictions affecting both the demand and the supply. The product changes the behaviour of farmers, who now see the product as acting as a substitute for collateral or credit history and as a powerful signal of the value of investing in more climate resilient production technology.

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

WINnERS has secured political support from: Tanzanian Government, Ugandan Government, AfDB, European Commission

WINnERS partners include Climate-KIC, Imperial College London, African Development Bank, CIRAD, Climate Justice Resilience Fund, L 'Ecole Polytechnique University Paris-Saclay, Mercy Corps, MunichRE, Private Agricultural Sector Support (PASS), Universiteit Utrecht, and The World Bank

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 programme currently covers smallholder farmers in the Global South, specifically Tanzania, Ghana, Uganda, and Zimbabwe. The WInnERS scheme could be scaled to be scaled to any geographical context.

The WINnERS scheme leverages the use of super computers and machine learning to tailor the payouts of an insurance product to specific locations in response to local weather patterns and exposure characteristics, such as soil and agricultural practice. The data driven product design technology allows the product to be upscaled country-wide thus reaping significant diversification benefits and avoiding loss verification costs and moral hazard issues. Local market participants document a cost reduction of 35-40% relative other agricultural insurance products.

What do you think are the key actions required to address this solution?

Public policies. Governments can use such systemic de-risking schemes to support smallholders and accelerate the transition towards climate smart agriculture. Through the WINnERS scheme, economic incentives could be provided to those farmers that are investing on climate solutions and improving their management practices.

The technological innovation introduced in the Tanzanian market has demonstrated that insurance, and more generally blended finance solutions, can provide a powerful tool to move beyond donor-based frameworks

and promote financial inclusion and technology adoption at scale by using market driven mechanisms. Examples: 1m USD commitment by the African Development Bank to deploy the product beyond Tanzania; commitment by the Ugandan Banking Association to introduce it in Uganda; USD 500k committed by Oak Foundation to use the technology to promote gender.

Change in behaviour of off-takers (crop buyers) in engaging in contract farming with smallholder farmers deriving from the coverage of crop loss risk resulting from the new parametric insurance technology.

SOLUTION 5.6 COMMUNITY GARDENS UTILIZING VERTICAL FARMING TOOLS FOR FOOD SECURITY

What problem is the solution trying to address?

- Access to innovation and technology for farmers.
- Maintaining food supply chain in times of conflict, shock and stress.
- Gender inclusion, nutrition and livelihood preservation/increased household income
- Water use efficiency.
- Environmental issues by using recycled materials like pallets.

What, in brief, is the solution?

Community and individual back-yard gardens utilizing vertical farming tools, local technologies, recycled and upcycled materials, low-cost drip irrigation or hydroponics.

It ensures the functionality of food systems in areas vulnerable to conflict and disasters. By;

- Deploying technology the communities food production systems are strengthened, yields increased and livelihoods improved.
- The solution ensures Nutrition is also addressed.
- Gender inclusion; women farmers are empowered.

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

Patience Koku, leadership group member of Action Track 5

What is the theory of change?

Combining community gardening with vertical farming will give farmers access to relevant technology in their production.

This scalable solution can be implemented utilizing minimal resources for maximum results, inspite of disruptions to normal food production systems as a result of conflict shock or stress.

The attendant improved yield increase and continued production in times of crisis ensures food shortages can be minimised or averted as communities in times of crisis can continue ‘to grow their own food’.

The systems can be set up even when communities are displaced with little or no pressure on already stretched resources.

The outcome is a resilient food system that produces efficiently in ‘normal' times and functions optimally in times of crises ensuring that food supply challenges are minimised if they cant be avoided completed.

The solution enables farmers and communities to grow more with less(water, land, input).

Through the value chain linkages ensures farmers earn more from the sale of their surplus thereby improving livelihood. The nutrition and several health of the communities is optimised.

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

The solution has great impact potential at scale, the synergy of community garden and vertical farming is game changing as both are current tools practiced independently with vertical farming being promoted currently in an urban context, this solution has the potential to revolutionise vegetable and fruit farming and provide a ready to go solution in times of conflict, shock and stress where conventional farming poses challenges or impossible. Alternative farming solutions must be encouraged to produce a resilient food system.

The cross cutting benefits across nutrition, livelihood improvement, water use efficiency, health, environmental and social divides make it a game changer.

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

The FAO, IFPRI,UNHCR and several organisations, institutions, and state actors.

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 is well suited to all contexts where food security, sustainable and efficient food systems are promoted.

Communities can grow their own food efficiently at all times leveraging on technology whether they be rural or urban and across times of stress, conflict or peace.

It is well suited ALL countries in various instances.

What do you think are the key actions required to address this solution?

Policy backing to ensure that the entire value chain is deployed.

Leveraging on institutional support from the UN, member states donor organisations and the private sector to deploy access to finance,market,resources training.

Engaging the entire value chain from policy to implementation is vital to ensure it meets it's full potential as a game changing solution.

SOLUTION 5.7 EMPOWER WOMEN'S AGENCY AND LEADERSHIP IN DEVELOPING RESILIENCE SOLUTIONS

Promotion of women's assets and tenure rights, women's leadership in resilience programs and policies, and funding (fund) for gender transformative resilience programs.

What problem is the solution trying to address?

- Women have less access to capital and banking services
- There are fewer women in leadership roles
- Women have less independence and social mobility

All the above and more make women less resilient and more reliant on others in times of crisis and need.

What, in brief, is the solution?

Empower women's agency and their leadership in developing resilience solutions

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

Robynne Anderson – Private Sector Mechanism

Why is addressing that problem important for achieving the goal of your working group?

The key goal is to create an environment in which women have agency: ie. The capacity to be independent, to pursue their goals and work on an equal footing with their male counterparts. By promoting agency, we will improve the resilience of half our population to shocks and stresses.

Beyond being important producers of food, women play vital roles in household nutrition. It is important to emphasize the need for women and girls to receive good nutrition.

How can this solution address that problem?

It is vital to have women in positions of leadership so they can develop and advocate for solutions that will speak to women's issues and unique hurdles.

We can consider three separate components that can be improved upon:

1. Women's assets and tenure rights
2. Women's leadership in resilience programs and policies
3. Funding (fund) for gender transformative resilience programs.

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

The UN FAO has said that women in rural areas have the potential to raise agricultural production to levels that would feed up to 150 million more of the world's hungry people if they had equal access to the means of production, including land, financial services, education and technology, according to a United Nations report released today.

Very few other levers exist that offer such a clear path to improving the ability of nations to be more resilient to shocks and stresses. Empower women to have agency, and it immediately improves a population's resilience.

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

The Nordic countries, Canada, the European Union as a whole, and Switzerland are all particular advocates in this area.

A wide array of organizations would also enthusiastically embrace this effort. Groups such as GENDER, IFPRI, and ILRI have proven to be leaders in this sphere. The UN CFS has prepared Voluntary Guidelines on Governance of Tenure to address land tenure. UN Women works on multiple aspects. CARE, Poverty Action, and numerous CSOs.

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 especially relevant and would be most impactful in developing countries and rural areas, which have not experienced the same push toward gender parity as more developed, urban geographies.

SOLUTION 5.8: EXPANDED AND IMPROVED FOOD SECURITY FORECASTING AND MONITORING, BASED ON THE INTEGRATED FOOD SECURITY PHASE CLASSIFICATION (IPC) AS THE ACCEPTED GLOBAL FOOD SECURITY ANALYSIS STANDARD

What, in brief, is the solution?

Expanded and improved food security forecasting and monitoring, based on the IPC as the accepted global food security analysis standard.

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

United States of America – Member State contribution

What problem is it trying to address within food systems?

Covid-19 has highlighted long-standing weaknesses in the humanitarian and development system for food security and famine prevention: The world does not have a singular source of information to provide real-time assessments of people facing acute food insecurity with the geographic scale to cover any country of concern, the ability to update forecasts frequently and consistently in near real-time, and with multi-stakeholder consensus building. In addition, existing early warning systems lack indicators to adequately monitor degradation of food systems.

Without this system, global policy makers and humanitarian funders are often left piecing together reports from various international organizations, which poses a number of challenges for harmonized, strategic, and timely action. This leads to sub-optimal allocation of ever more scarce resources and risks those people and geographies that need support most to be ignored or significantly underserved.

How can this solution address that problem?

There is a globally accepted standard for food security analysis classification, the so-called Integrated Food Security Phase Classification (IPC). While there is a chronic and an acute IPC food insecurity scale, the IPC is currently mostly used for humanitarian response and is largely unknown among development players. It has good potential to become a “common language” and help breathe life into the much debated but rarely seen humanitarian-development nexus.

The IPC provides a standardized analytical framework with an agreed set of core indicators. These can be refined, in particular where longer term food security is concerned, e.g., through agriculture interventions. IPC analyses can also benefit from better data availability and provision (Note: The IPC does not itself collect data but draws in available data from reliable sources.) Its analytical and consensus building processes can also be strengthened further through innovative technology, primarily AI.

Leading international organizations are working to actively improve the state of food security analysis, including the Food and Agriculture Organization of the United Nations, FEWSNET, the World Bank, the UN World Food Program and others. Their work is based on the IPC, the global food security monitoring standard methodology. A vision of a strong future information system would build on the IPC as the accepted standard methodology and classification and draw on all relevant existing work by other actors, while building a strong, innovative independent global system.

The expanded and improved system would be built on existing early warning systems through improved coordination or consolidation. There could be resistance to consolidating all of the existing systems into a single system. New indicators need to be identified to enable the system to better capture deteriorating

conditions in food systems (e.g., market disruptions) that could lead to increases in chronic food insecurity. The geographic coverage of the system would have to expand beyond the current coverage of existing early warning systems. Designing, building and maintaining this system would require dedicated and sustainable funding.

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

This action would reduce the global humanitarian assistance burden and prevent future crises. The potential cost savings from reducing humanitarian assistance needs over time should make it both politically actionable and sustainable.

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?

Existing early warning systems have already proven their feasibility. Efforts are already underway to expand early warning and predictive capabilities. The World Bank and FAO, for example, are working on separate initiatives in this area. A comprehensive system would need to build on this existing work.

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

Several bilateral development agencies have been discussing this idea. The informal Development Ministers contact group, which convened last year to address the impacts of COVID-19, endorsed a call to develop an expanded and improved food security forecasting and monitoring system.

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

An expanded and improved food security monitoring and analysis system is a global public good. It has particular relevance for fragile areas. It will serve to strengthen resilience in the humanitarian-peace-development nexus as well as in the context of increasing risks from climate change.

What do you think are the key actions required to address this solution?

Engage women in the solutions in resolving, mitigating, and adapting to a particular shock from the beginning.

Build women's assets to deal with the shock – economic empowerment with a clear eye on equitable benefit sharing and decision making on the benefits. This can range from ensuring women have access to vaccines for their livestock so that they survive and can be used to buy the COVID vaccine to all the other work the CG is good at.

Push for the bigger players like UNFSS to invest in gender so that the systems can be changed. Invest in gender expertise in all process and projects, not just to do an analysis but actually ensure change.

SOLUTION 5.9 E-COMMERCE ECO-SYSTEM SOLUTION FOR RURAL TRANSFORMATION (PLATFORMS TO REACH LAST MILE HOUSEHOLDS)

What problem is the solution trying to address?

Lack of or limited access to markets are obstacles facing rural communities and are identified as one of the main problems resulting from market inefficiencies. Small profit margins for small farmers who sell to many buyers disincentivize current and potential new farmer entrants as well as potential investments which will increase productivity levels and increase post-harvest storage and management. In Sub-Sahara Africa, post-harvest losses alone exceed 30% of total crop production and represents more than USD 4 billion in lost value every year. Smallholder farmers and small and medium enterprises (SMEs) in food value chains (agriculture, fisheries, forestry, livestock, processing, distribution) are disproportionately affected as their gains do not effectively offset existing transaction costs and the risks of engagement. Subsistence and resource poor farmers, women and youths (along with other marginalised groups) who do not have access to sustainable livelihoods because of economic pressures, lack of infrastructure and networks and poor governance arising from non-functioning food systems will benefit. Increased food availability contributes to addressing vulnerability in times of conflicts; climate extremes; economic shocks and pandemics.

What, in brief, is the solution?

The e-commerce ecosystem solution has four key components.

- Component 1: Increase the e-commerce **preparedness of farmers** and the competitiveness of their products.
- Component 2: Strengthen **e-commerce ecosystems**, including e-commerce platforms to be more accessible for farmers and e-commerce ecosystem broader actors who will provide supportive services such as payment, credits, storage, marketing, packaging, transportation and delivery services.
- Component 3: Increase **last-mile connectivity**.
- Component 4: Enable governments and institutions to develop **proactive policies and create an enabling environment for businesses**.

E-commerce solutions provide the opportunity to leverage technology to reach women, youth, poor farmers thus addressing the SDG agenda of leaving no one behind by empowering women and youth by strengthening their income opportunities through new job opportunities in the farming and food-system support sectors (such as R&D, packaging, digital marketing, logistic and financial services).

Three models are proposed, namely

- The private sector driven model - Private e-commerce firms-led with government interventions and development partner support
- The public sector driven model - Government-led investment with private sector and development partner participation
- The development partner driven model – Development agency with an exit strategy

Models 1 and 2 are a combination of public/private partnerships.

Complements other game changing solutions in other Action Tracks - E-commerce solutions are complementary to other proposed game changing solutions in other Action Tracks, such as: social accountability; community development collectives; capacity strengthening networks; the AT4 proposed Global Matching grant fund for capital investment in small and family agriculture; the effort for “fair markets, fair prices and fair wages”; local procurement and increasing investment in rural infrastructure.

Target groups: smallholder farmers, small and medium enterprises in food value chains (agriculture, fisheries (including fish farming), forestry, processing, distribution), women and youth.

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

The solution emerged from the public survey of Action Track 5 for game changing solutions and from two member states. The World Food Programme as anchor agency for AT5 has also recommended this solution and is developing programmes with and for several African countries. WFP has also received requests and is in the early stages of exploratory discussions for support in developing e-commerce solutions from Latin America and Southeast Asia.

What is the theory of change?

Use of e-commerce within the agricultural sector increases the sector's contribution to the economy through an increase in GDP brought about by a diversified economy. It can attract investments to make the economy robust and it facilitates private investments necessary for infrastructure, architecture and services to support the solution. Employment opportunities will be created through an increase of skilled and unskilled jobs for youth and women in rural, peri-urban and urban areas.

When used in an integrated manner, the e-commerce ecosystem solution offers opportunities for all players in the food system to collaborate. Development partners can support governments in their objective of rural transformation that will in turn strengthen food systems. Governments can use the opportunity to drive growth in the agricultural sector while improving livelihoods of small-scale farmers and SMEs and to raise revenue to invest in the social sector. Entrepreneurs, who are profit driven can enter the market at the end of the value chain, through bulk buying to serve local, regional and international markets and/or investing in logistics and storage facilities.

Assumptions:

The number of countries that can engage in e-commerce depends on the facilities that are available in country, particularly in developing countries. Countries that have high digital readiness, mobile internet penetration, improved or improving logistics, reliable energy supply and a strong regulatory and fiscal environment are strong candidates for e-commerce platforms.

Inputs:

- Efficient and affordable internet connectivity which would allow buyers and sellers to connect over online platforms;
- Regular and sustainable energy supply or access to energy which reduces the farmers' input costs;
- An enabling policy and regulatory environment, particularly in the telecoms and finance sector;
- Infrastructure, such as roads, warehouses and storage facilities;
- Fiscal policies that do not deter the entrepreneur and will encourage key investors to enter the market;
- Availability of new research technologies in a timely manner such as food and commodity crops that are high yielding and can provide high returns; are nutritious and can satisfy demand and consumer requirements;
- Enhanced technical support for farmers and buyers to keep farmers updated on changing food trends for diversified crop production;
- Safeguarding the environment/availability of agricultural land – protections for the small-scale farmer that agricultural land is not bought up by large corporations as evidenced by rising global interest in available African farmland, for example;
- Grants for small scale farmers from donors/development partners to support farmers' capacity building in business skills training;

- Increased donor/development partner loans on favourable terms to farmers and SMEs such as the World Bank's credit facilities for entrepreneurs;
- Donor/development partner support to provide grants - for capacity building of small-scale farmers in ICT, for small scale farmers to organise and form co-operatives with expert help to organise and aggregate farmers' produce for sale on the platform and negotiate with potential buyers;
- A financial intermediary for the payment system – depending on the local context it could be a development partner, such as WFP, who will take on the risk until the volumes of produce sold can attract a private financial provider as an intermediary (see model 3).

Outputs:

- Increased supply of affordable, safe and nutritious food that will create increased demand;
- A strengthened national food system because of increased investment in the economic and social sectors;
- Increase in potential investors attracted to the sector providing services and facilities for the farmer and to create jobs such as in transportation, ICT, logistics;
- Greater availability of finance products to farmers and SMEs because of collateral and assured markets;
- More independent finance institutions offering credit to SMEs and other potential investors.

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

The e-commerce solution is not a new concept and pioneer experiments have already been established in urban areas. However, the e-commerce ecosystem has not yet realised its potential to reach and empower small-scale farmers and vulnerable communities. It addresses the SDGs for long term sustainable growth to meet the 2030 objectives and contributes to transformation of food systems. A World Bank report in 2019 found that e-commerce in rural areas can empower vulnerable populations, diversify rural economy, narrow the gap in entrepreneurship between men and women, and create new jobs in non-farming sectors including processing, packaging, marketing, delivery, payment and financial services. When scaled up the solution can open other markets at the national level and regional levels, can strengthen regional integration by promoting peace and stability through trade within regional economic areas. It also provides the opportunity to extend public/private partnerships where governments can be encouraged to provide pro-active policies to leverage private sector investments.

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

The government of China is ready to support this global effort for e-commerce solutions and the government of Turkey contributed the proposal for virtual markets to the AT5 public survey. A few African countries have expressed strong interest in e-commerce solutions. These countries are namely Ethiopia, Ghana, Kenya, Senegal, Malawi, Burundi, Rwanda, Togo and Côte d'Ivoire. These African countries and El Salvador are currently working with WFP and are at different stages to explore establishing e-commerce marketing. A pilot project by WFP in Zambia in 2017 proved successful within its limitations and provided support to 2,500 farmers. Other countries that may be of interest for partnership with WFP in e-commerce solutions include: Vietnam, Malaysia, Thailand, Indonesia and the Philippines. These countries are working with Alibaba on e-commerce training for entrepreneurs. WFP has country presence in Indonesia and the Philippines and would seek to explore collaboration with these two countries on e-commerce marketing.

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 is well-suited to all geographies and in country contexts where there is high internet penetration and digital infrastructure. It will also suit countries with a degree of political stability and commitment and where produce can be mobilised and farmers can be organised. In addition, e-commerce solutions facilitate COVID adaptation and mitigation efforts by facilitating efficiencies and transactions in the value chain without creating greater risks for individuals and communities during health shocks.

The solution will not be well-suited in contexts where local financial intermediaries are unwilling to take on the payment guarantee risk and conduct due diligence of both the buyer and seller (farmer). In such cases, the example of the WFP Manoo App – model 3 - that was piloted in Zambia, though limited can be used as a transition mechanism.

What do you think are the key actions required to address this solution?

The key action to be taken is for the following to be addressed before the solution is implemented:

Public policies to address:

- High logistics costs, weak ICT access, low literacy, including digital literacy, and ICT skills, limited purchasing power, low energy supply and lack of resources and capacity for business building.
- Insufficient advice on crops selection – those that have ready markets and can be easily traded on the platform;
- Lack of finance for farmers to invest in their businesses; and
- Land tenure/land allocation.

Corporate actions/development partners to address:

- Weak ICT access and low internet penetration, weak payment infrastructure, low literacy and ICT skills;
- Lack of resources and capacity for business building;
- Low digital literacy and relevant training for grassroots communities, including smallholder farmers and farmers co-operatives;
- Establishment of produce aggregation facilities so that small farmers do not to lose out and train local aggregators to represent farmers. The WFP Manoo - Virtual Farmers Market which was launched in May 2017 targeted 2,500 farmers and 50 ambassadors were selected to aggregate on behalf of their communities;
- Support to farmers to form collectives for selling their produce on the platform, thus aggregating produce with their peers.

SOLUTION 5.10 TOOLS FOR ACCELERATED BREEDING AND TRAIT MINING UNDERSERVED CROPS

Germplasm, Sequencing, Trait mining, Phenotyping, Precision Agriculture

What problem is the solution trying to address?

Climate change is having far-reaching impacts on agriculture and food systems across the globe. Climate-resilient agriculture needs tools to address the impacts of abiotic stresses (e.g., drought, heat, salinity) and biotic stresses (e.g., diseases and pests), as well as well to manage and minimize inputs (e.g., water, fertilizer), while still meeting the nutritional needs and preferences of consumers.

In the past, the Green Revolution tackled hunger using a combination of genetic and agronomic improvements to key crops in the developing world. More than 60 years have passed since then and most of the cultivated crop varieties were selected when the carbon dioxide levels were lower, and temperature ranges narrower than today. There also continue to be negative impactors of production (e.g., poor soil fertility, limiting water, diseases, and pests). Research will need to focus on these targets and facilitate and integrate genetic improvements with modern agronomic practices using sensors and data-driven management to achieve sustainable, climate resilient agricultural systems.

New research outcomes will be essential to produce these novel, accessible and affordable tools and technologies for the developing world. Where possible, these should be developed through coordinated global partnerships with stakeholder input and be deployed through local and regional networks.

What, in brief, is the solution?

Tools for accelerated breeding and trait mining for underserved crops

Germplasm: There are estimated to be approximately seven million crop accessions conserved in gene bank collections worldwide.

The CGIAR Genebank Platform led by The Crop Trust represents a rich resource for genetic diversity of regional importance to developing world farmers, representing about 10% of the worldwide gene bank collections. Through this platform, the eleven CGIAR Genebanks safeguard a unique global resource of crop and tree diversity and respond to thousands of requests for germplasm from users in more than one hundred countries worldwide every year. They are working towards more targeted use and exploitation of the collections by enriching the associated data through the use of large-scale genotyping and phenotyping. Their location in centers of crop diversity ensure that acquisitions are global with a diverse partner and user base. The Crop Trust also manages the Svalbard Global Seed Vault, the world's largest collection of crop diversity that serves as an important safeguard against natural and man-made disasters.

In the UK, the Germplasm Resource Unit serves as a long-term repository for some of the most comprehensive wheat, barley, oat and pea collections globally, accessible through SeedStor. The European Cooperative Program for Plant Genetic Resources (ECPGR) is a CGIAR network that promotes conservation, management and sustainable use of plant genetic resources.

In the U.S., the U.S. Department of Agriculture (USDA) germplasm resources are accessible through the GRIN Global portal. In China, the China National Crop Germplasm Gene Bank at the Chinese Academy of Agricultural Sciences (CAAS) in Beijing holds over 400,000 crop accessions, over 65% of which were land races and varieties collected from China. The China National Gene Bank (CNGB) in Shenzhen also serves as an integrated repository for data and plant, animal and microbial resources of importance to agriculture. A

noteworthy feature of CNGB is its integration in one place of the germplasm and one of the largest sequencing output capacities in the world (about 24 Pb/year).

There is little information available about the genetic composition of the majority of these accessions, making it difficult and time-consuming for breeders to identify sources of desired traits or introduce them into local crops to create new, more climate-resilient varieties. This is a critical step to maximizing the utility of available germplasm resources to widest range of global stakeholders.

Sequencing: The first step to capturing the genetic diversity within and across crop species is to sequence their genomes. Advances in sequencing technology have led to a reduction in cost of an assembled 1Gb genome to the ~$2,500 range, and resequencing a plant genome to about $5/Gb.

- Selection of sequencing targets should include stakeholders as well representatives of ongoing efforts such as DivSeek International and EarthBioGenome.
- Potential sequencing partners would include the U.S. Department of Agriculture's Agricultural Research Service and National Institute for Food and Agriculture, as well as the U.S. Department of Energy Joint Genome Institute and CNBG. There are comparable sequencing core facilities across Europe.

Trait mining: Trait mining tools are needed to accelerate identification of targets for breeding. Trait mining is currently a far more expensive and challenging step than obtaining sequence information and achieving high throughput will require artificial intelligence-based approaches, like machine learning. The tools for mining livestock traits are currently more advanced than for crops.

Machine learning tools are evolving quickly, primarily for non-agricultural applications in the private sector. Rather than duplicating these tools, it would make sense to catalyze their application to agricultural datasets in the public sector. This approach is likely to be especially effective in plants because there are more than 300,000 species adapted to numerous environments.

Through public-private partnerships, machine learning strategies could be developed to mine sequence data for key traits at a reasonable cost. Important target traits would include:

- Photosynthesis under diverse environments
- Disease resistance
- Nutrient and water sensing
- Thermotolerance

Potential partners for this strategy include, but are not limited to:

- Google, which has an agricultural focus area
- Facebook AI Research (FAIR), which has been working with biomedical groups but could potentially apply its tools to agricultural problems
- The Peng Cheng Laboratory in Shenzhen, China, a newly established research center of excellence in AI, space networking, and their applications.

Phenotyping: The plant phenotype represents the set of its observable characteristics resulting from the interaction of the plant genotype with the environment ("GxE"). For crops, the "environment" includes biotic (beneficial and pathogenic microbes), abiotic components (water and temperature) as well as managed inputs (nitrogen, phosphorus, and potassium). Plant phenotyping under field conditions is lagging sequencing but is a key part of understanding crops in their agricultural contexts.

There is a need to evaluate phenotypes as part of understanding the performance of new crops and varieties in the regions into which they will be introduced. There are multiple international initiatives that focus on regional crops, including the U.S. Genomes to Fields Initiative, the European EMPHASIS program, and the International Plant Phenotyping Network, which includes Austria, Australia, China, Germany, Italy and France

as national partners and regional partners in Europe, North America and Latin America. These tools and resources need to be extended to allow evaluation of new crop varieties under local conditions, for example, in partnership with CGIAR centers.

Sensors: Currently, most sensors have been developed for use in large-scale farming operations for major crops such as maize and soybean. They provide diverse read-outs for such variables as moisture, soil pH, soil nutrients and compaction. Optical sensors are also used to measure plant variables from surface readings. In the U.S., start-up companies such as FloraPulse are commercializing microsensors inside plants for monitoring water use by commercial crops while in Europe, the Plantenna consortium is developing innovative sensors for plant stress and environmental strain for sustainable farming. These advances need to be extended to serve the broad needs of smallholder farmers.

Low-cost sensors of multiple types are needed for field management of the broader range of crops grown globally. This could be accomplished efficiently *via* public research and public-private partnerships for deployment. Greater investment is needed to bring sensor costs down, to meet specific needs, and to ensure widespread availability.

Outputs from sensors can allow farmers to respond quickly to environmental changes by adjusting water and nutrient inputs. High income countries make substantial investments in precision technology for a few major crops but in other parts of the world, there is little control of water or fertilizer use. Significant opportunities also exist in Africa to increase food productivity without huge infrastructure or input investments through the use of sensors. Expanding networks of sensors connected to cell phones could help farmers accelerate the use of more sustainable and productive agricultural systems.

Precision agriculture: Also termed "smart agriculture", this approach relies on a combination of new technologies (improved germplasm, sensors, data-driven management practices) to increase crop yield while reducing inputs: getting more with less. New germplasm that is better adapted to local conditions (e.g., drought, heat, salinity) can be better managed through data obtained from sensors to maximize yield and reduce environmental impacts. This is a major research direction in the U.S., with public funding programs supported through the U.S. Department of Agriculture as well as extensive R&D in the private sector. The focus is largely on major crops such as maize and soybean but there are tremendous opportunities to extend these benefits to smallholder farmers through global public/private partnerships.

There is an ongoing Precision Agriculture for Development (PAD) initiative, which currently supports smallholder farmers in Ethiopia, Bangladesh, India, Kenya, Nigeria, Pakistan, Rwanda, Uganda, and Zamia through local partnerships. It could serve as a hub for regional deployment of improved tools and resources.

What were the source(s) from which this solution emerged?

The solution emerged from two workshops convened in August 2018 and August 2020 by The Supporters of Agricultural Research (SoAR) Foundation. Each convening comprised more than a dozen eminent scientists from the United States, the European Union, and China, from a range of research fields including biotic and abiotic stress tolerance, breeding strategies, photosynthetic efficiency, nitrogen fixation, and soils. The report, entitled "Developing Global Priorities for Plant Research: Adapting Agriculture to Climate Variability", provides more detail about the specific goals, current players and funders.

How can this solution address that problem?

This solution can address the problem because it will combine:

- Financial support for research innovations to address key needs
- Coordination of existing and new participating organizations

- Potentially measurable benchmarks and outcomes
- Engagement of key stakeholders

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

This solution meets the criteria for a "game changing and systematic" solution because:

- It will have the potential, when implemented, to impact a broad range of stakeholders whose needs are not currently being met
- There are existing research efforts and potential funders who can be connected to achieve its goals
- It has the potential to evolve and grow as it meets its initial objectives

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

Individual member states and foundations are already supporting aspects of this research. In addition, there is the potential to partner with the private sector to extend the utility of existing tools to serve the needs of smallholder farmers. In addition to support from the US Department of Agriculture Agricultural Research Service and National Institute of Food and Agriculture, the European Commission, Research Councils UK (RCUK), the Bill & Melinda Gates Foundation and the Rockefeller Foundation also provides funding for aspects of this work.

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 would work well in areas that are part of the CGIAR system and/or have strong national agriculture research systems. It will be more challenging, but not impossible, to extend the benefits of research outcomes to smallholder farmers in conflict settings or areas where the infrastructure is less developed.

What do you think are the key actions required to address this solution?

- Establishment of international coordination bodies to synergize and focus existing programs and initiatives for each goal.
- Financial support for coordination activities.
- Formation of public-private partnerships where these make sense.

SOLUTION 5.11 INTEGRATED APPROACH FOR SUSTAINABLE SOIL MANAGEMENT: THE GLOBAL SOIL PARTNERSHIP

What problem is the solution trying to address?

Low resilience of agri-food systems to global crises and consequent food insecurity

What, in brief, is the solution?

Integrated approach for sustainable soil managemen

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

The World Soil Charter (FAO, 1981) adopted by all FAO members in 1981 and its revised version (FAO, 2015) set out the basic principles of sustainable soil management and the actions to be taken by each soil-related stakeholder. These principles were applied to specific soil threats and translated into concrete actions in the Voluntary Guidelines for Sustainable Soil Management (FAO, 2017). Since then, the GSP has been developing technical and normative tools to adapt principles and practices of sustainable soil management to local needs and stakeholders.

Why is addressing that problem important for achieving the goal of your working group?

The adoption of sustainable soil management (SSM) practices will lead to more resilient agri-food systems and ensure food security for all (including sufficient, safe and nutritious food for all). It will in turn contribute to halting soil degradation, restoring degraded soils and protecting C-rich and biodiversity-rich soils, which contribute most to the provision of ecosystem services.

What is the theory of change?

Barriers to solve the problem of low resilience of agri-food systems and food insecurity:

- Scarce soil data and of poor quality
- Inexistent soil health indicators
- Low awareness on soils importance and processes
- Resistance of local communities to change agricultural practices
- Limited technical knowledge on locally-adapted SSM practices
- non- favourable or inexistent policies

Inputs: There are three concrete actions to improve the resilience of agri-food system:

1. Awareness is raised on the vital role of soils on food production, human health, and climate change resilience at all levels.
2. Knowledge on soils is enhanced through targeted research and harmonized information and data collected at local, national and global levels.
3. Sustainable soil management is adopted supported by the development of an enabling political and financial environment.

Impacts: Degraded soils can be restored, food production capacity increased, soil pollution reduced, nutrient content of food improved, farmers' incomes increased, human health promoted, climate change partially mitigated, and soil biodiversity and water resources preserved.

Outputs: Change will be achieved and sustainable over time because farmers and society will understand the importance of managing soil sustainably, and the negative impacts of unsustainable practices.

Assumptions: sound scientific knowledge that supports the selection of best and locally-adapted SSM practices is a prerequisite. Understanding the status of soil is also needed to identify the SSM practices needed – soil analysis, mapping and monitoring. There must be an enabling financial and political environment that favours the adoption of SSM.

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

Sustainable soil management is a feasible paradigm shift in agriculture, but it is also applicable to other land uses. There is sufficient and strong scientific evidence to demonstrate the role of SSM to achieve healthy soils and ecosystems resilience, the production of safe and nutritious food, and in solving the invisible crises that put agri-food systems at risk: the water crisis and soil degradation.

SSM is a theoretical-practical framework that encompasses many concrete practices and initiatives, such as agroecology, conservation agriculture, regenerative agriculture, and aims to protect and conserve the natural resource essential for food production and the resilience of agri-food systems.

SSM practices increase the organic matter content of the soil, which is the fundamental building block for nutrition, water storage, and purification of contaminants. All the carbon that accumulates and is sequestered in soils is removed from the atmosphere, thus contributing to climate change mitigation.

In addition, organic matter also contributes to the supply of other nutrients, reducing dependencies on external inputs. On the one hand, the economic cost for farmers is reduced, and on the other hand, a lower input of fertilisers, especially nitrogen, reduces N_2O emissions into the atmosphere (a potent greenhouse gas), and the eutrophication of surface water and contamination of groundwater.

A soil with adequate organic matter content is also a living and biodiverse soil. The richness of micro-, meso- and macro-organisms gives the soil and the vegetation growing in it the ability to be more resistant to pests and diseases, thus reducing dependence on pesticides. In addition, the symbiotic relationships that occur between soil organisms and crops provide a win-win situation by supplying all the necessary nutrients.

SSM can increase, but above all, maintain crop production over time and guarantee stable earnings for farmers. At the same time, by reducing dependence on agrochemicals and relying more on the recycling of on-farm waste, costs are reduced.

Healthy, sustainably managed soils contribute to at least seven of the SDGs. The clearest link, and where soil is at the heart, is between the SDGs on poverty, food, water and health. Healthy soils ensure food security now and in the future (SDG 2), understood as sufficient, safe and nutritious food. Water and soil pollution are closely linked, and both require judicious use of agrochemicals and proper waste management to be avoided, thus ensuring water quality (SDG 6) and human health (SDG 3). Healthy soils contribute to poverty alleviation (SDG 1) by reducing farmers' dependence on agrochemicals and improving yields and other ecosystem services, but also by supporting healthy people allows for better opportunities. Healthy soils also have a major influence on the quality and health of terrestrial (SDG 15) and aquatic ecosystems (SDG 14), and are a key ally in climate change mitigation and adaptation (SDG 13). Including circularity within the SSM contributes to sustainable production and consumption (SDG 12).

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

The sustainable soil management promoted and adopted through the Global Soil Partnership has strong political, technical and social support, as it is backed by a network of networks made up of the 193 member countries of FAO and the European Union, other UN agencies (such as UNFCCC, UNCCD, UNEP, CBD), international initiatives (such as 4 per 1000, the Soil Health Institute), soil science societies, universities, research centres, NGOs, farmers' associations, civil society organisations and the private sector.

The GSP is organized in regional partnerships and multidisciplinary international technical networks. It is also supported by the Intergovernmental Technical Panel on Soils.

Multiple donors strongly support the promotion and adoption of sustainable soil management worldwide through the GSP, such as the European Union, the Russian Federation, Switzerland, Thailand, China, the Republic of Korea and the Netherlands, as well as private sector members such as PhosAgro or IFA. Other donors also support similar initiatives, such as France through the 4per1000 initiative or Germany through GIZ. Large private funders, such as the Bill & Melinda Gates and Rockefeller Foundations, have also invested in sustainable soil management in past years. Therefore, there is a great interest and support for this game changer solution.

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

Given that the resilience of agro-ecosystems and the production of sufficient, safe, and nutritious food is a global priority, sustainable soil management is able to provide solutions adapted to all contexts and therefore well suited to all existing agri-food systems.

SSM consists of simple, low-tech practices adaptable to all agro-ecosystems and is therefore relatively easy to adopt if supported by awareness and knowledge of the state of the soil, to ensure that the practices adopted will have a positive effect in the short, medium and long term. SSM is applicable by small, medium and large producers, as well as in urban agriculture as it involves site-specific practices.

What do you think are the key actions required to address this solution?

The GSP has developed a series of normative and technical tools targeting different stakeholders that allow the adoption of SSM at the three main levels:

- Public policies: Improving soil governance and creating an enabling political and financial environment is a prerequisite for the effective adoption of SSM. The Revised Global Soil Charter, the Voluntary Guidelines for Sustainable Soil Management and the International Code of Conduct for Fertiliser Use and Management provide the basis for the development of integrated soil management policies.
- Corporate: Improving soil information collection and analysis, and enhancing technical capacities on sustainable soil management by working directly with farmers, and by promoting greater recognition of agricultural products produced under SSM within production chains, ensures the effective implementation of SSM practices. The Global Soil Doctors Programme is a tool available to improve farmers' capacities. The Global technical networks of soil laboratories (GLOSOLAN) and soil information systems (INSII) provide additional support to improve soil knowledge and information for targeted practices.
- Civil Society: Increasing soil awareness throughout society is fundamental for the population to demand regulations and incentives from governments for sustainable soil management, but also to change production and consumption patterns. World Soil Day has proven to be a key tool in raising awareness, reaching 850 million people in 2020.

SOLUTION 5.12: THE SAHEL RESILIENCE INITIATIVE, INTEGRATING FOOD FOR ASSETS, SCHOOL FEEDING, NUTRITION, CAPACITY STRENGTHENING AND SEASONALITY.

Problems/challenges addressed in relation to food systems resilience

Many countries are experiencing record levels of hunger as a result mainly of conflicts, the effects of climate change and impacts of the COVID-19 pandemic. If current trends continue the current situation could worsen. Alongside the humanitarian response to the immediate and acute needs in crisis and emergency situations, there is a sense of urgency in tackling the underlying causes of crises. This is key to **reduce the rising needs** of the most vulnerable people affected by food insecurity and chronic and acute malnutrition. These **people play a critical role to the achievement of resilient food systems**. Small-scale farmers for instance who are likely to suffer from hunger, are vital for feeding both rural and urban people and to maintain nutritional diversity especially in contexts where the need is greatest. As they mostly serve domestic markets, they are particularly important in times when trade is compromised. Sine a number of factors are putting the resilience of small producers - and food systems more generally- at risk, their local knowledge needs to be preserved and their capacities be strengthened.

Addressing the concurrent and multiple shocks that are impacting the resilience of people and communities requires a holistic and intersectional approach. In fragile and conflict settings joint humanitarian and development action is needed to strengthen resilience at the individual and household, community and ecosystem, as well as national systems level. **Yet, the interventions taken in response to food crisis, too often remain scattered, isolated, small-scale, poorly integrated, uncoordinated and often short-term, achieving little transformative change to create sustainable livelihoods ("building back better").**

Description of the proposed solution/approach

In conflict-plagued and fragile contexts the impact of resilience building interventions focusing on nutrition and capacity strengthening, could be maximized if designed and implemented as an integrated package of activities that rests on the following drivers for change:

- **Sustained investments and concentration of interventions**: Food assistance and complementary interventions of different partners should target the same community (-ies) in the same locations over several years. They should be designed with a context-specific strategy focusing on strengthening resilience, food security and nutrition and have sustainable exit-strategy.
- **Context-specific and multi-sectoral approaches:** Overcoming crises at the local level always requires a whole set of interventions which are tailored to the indicidual needs on the ground.
- **Joint action and coverage of activities**: Operations need to go beyond meeting the sole minimum of food consumption aspects, in order to break negative coping strategies and allow people to strengthen their resilience. Joint action and comeplmentary partnerships based on comparative advanteges of different actors will be key to implement a multidimensional and multisctoral response.
- **Scaling up to match the 'size' of the problem**: The scope and size of interventions of a coalition of partners need to be commensurate to the size of the crisis or shock that impacts specific target districts and communities. Failure to achieve sufficient scale results in external pressure forcing relapses back to food insecurity and malnutrition and exposure to shocks.

Investing in evidence: Aiming at working more impact-related and evidence-based, resilience-building interventions should be informed by concrete analysis and data collection.

Implementation Approach/"Best practice"

Through support of BMZ, a comprehensive programme, the ***BMZ/WFP Sahel Resilience Initiative (SRI)***, is being implemented by WFP across the Sahel (Burkina Faso, Chad, Mali, Mauritania, Niger) to address the root causes of vulnerability and sustainably improve the nutrition and livelihoods of the most vulnerable people, mostly smallholder farmers. Strengthening their capacities is facilitated by building on existing structures and knowledge of the population. All measures are planned in a participatory manner, thereby facilitating dialogue and strengthening social cohesion. An integrated package of activities—combining Food for Assets (FFA), school feeding, nutrition, capacity strengthening and seasonal support—is implemented across the region, at scale and in the same communities. The same vulnerable people are targeted over a period of at least five years. The package is nuanced to suit different livelihood contexts pastoralist and agro pastoralists-alike and meet the needs of the population. Thereby the programme addresses both environmental degradation and communities' lack of productive assets, as well as individual households' chronic vulnerability and lack of livelihood opportunities.
Based on shared outcomes and respective comparative advantages, UNICEF is complementing WFP´s resilience interventions. UNICEF´s activities cover WASH, education, nutrition, health, and social protection ensuring geographical convergence, joint planning and coordination mechanisms as well as joint strategies for resilience programming.
To generate robust evidence of the transformative impact of this approach, interventions in Mali and Niger are currently being accompanied by impact evaluations in cooperation with the World Bak. The findings will inform ongoing programming and allow for adjustments if measures do not achieve the anticipated impact.

Impact potential at scale *(including potential return on investment)*

Since its inception, 1.2 million people were reached through activities of the SRI. Achievements include, among others, the rehabilitation and treatment of 31,000 hectares of degradated land and the provision of regular meals to children in 1,200 schools.

Overall, first trends indicate the intervention's positive effect on community resilience and food security. Preliminary evidence suggests that after just one year of programme implementation, beneficiary households had stronger capacities to absorb and adopt to shocks during the COVID-19 crises in comparison to non-beneficiaries.

The first annual follow-up surveys answered by beneficiaries revealed, for example, that assets created or rehabilitated in their community protected their household, goods and productive capacities. Most interviewees stated that assets allowed them to increase or diversify their agro-pastoral production and that they contributed to the improvement of the natural environment, including increased vegetative cover or groundwater, less erosion, etc. The results further show that agricultural practices of assisted communities are increasingly becoming nutrition-sensitive with the cultivation of diversified crops and the development of market gardening. Also trends on food security and nutrition are encouraging and show an overall improvement of communities' food security. The accompanying impact evaluations will provide further insights into successes of strengthening resilience of vulnerable smallholder farmers and thereby of food systems more generally.

First evidence shows that this integrated pacake of activities, implemented in different countries by different actors, and aligned with collective outcomes, is the way that generates the biggest impact. Therefore, **we work on scaling up our approaches and incorporating additional resilience sites across the region.** This explansion will be informed by lessons learned and the need to focus on highly vulnerable communities which have both, commitment and potencial to achieve resilience.

SOLUTION 5.13: USE OF INTERNATIONAL AGREEMENTS PREVIOUSLY NEGOTIATED IN THE COMMITTEE OF WORLD FOOD SECURITY. VOLUNTARY GUIDELINES (GOVERNANCE OF LAND, FISHERIES, FORESTRY AND FOOD SYSTEMS) AND CFS FRAMEWORK FOR ACTION FOR FOOD SECURITY AND NUTRITION IN PROTRACTED CRISES

What, in brief, is the solution?

Promote at national, regional and global level the use, adoption and adaptation of the CFS negotiated policy convergence products which all reflect the AT 5 approach (what, how), but in particular its latest product, the CFS *Framework for Action for Food Security and Nutrition in Protracted Crises* adopted by consensus in 2015 http://www.fao.org/3/a-bc852e.pdf [CFS-FFA]. This framework guides humanitarian and development stakeholders on how to address the critical manifestations of food insecurity and build resilience; adapt to specific challenges and context; and contribute to addressing underlying causes.

For other products, or on-oing workstreams - such as that of Food Systems and Nutrition, Agro-ecology and other innovative appraoches, and Gender Equality and Women's (and Girls) Empowermwent – as well as upcomign ones such as the workstream on Data and on Inequalities, visit the CFS website to see the all products of CFS all of which are of interest to AT5: *http://www.fao.org/cfs/home/products/en/*}

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

CFS, private sector. But other proposals that speak to policy convergence and framework put forward link to this (e.g. by FAO, or other entitites).

What problem is it trying to address within food systems?

The CFS is a policy convergence space, with no executive mandate to apply and implement its prodcuts, relying primarily on the good will (and capacity) of the adhering 134 Members States and constituencies to adopt and adapt its products.

How can this solution address that problem?

- Awareness raising and training at regional and national level on the 11 Principles of the CFS-FFA will support adoption and adaptation to context.
- This requires financial and technical support to adapat the guildeliens to context, over time to engage across sectors and stakeholders in a meaningful and effective manner.

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

- It is feasible, actionable at scale and sustainable (once dissemination of the CFS-FFA is done, then adaptation in specific country contexts will make it a self-contained "way of working")

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 the CFS Summary of the uptake of the CFS-FFA from 2020. See: http://www.fao.org/3/ne740en/ne740en.pdf
- The upcoming Global Thematic Even on the uptake and use of the CFS-FFA at CFS#47 will also provide further examples of experiences in applying the CFS-FFA.

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

- Some 134 States are currently embers of the CFS;
- Stakeholders include civil society, private sector, academia, UN, national governments;
- The RBA agencies jointly specifically support the CFS, and the UN in general.

SOLUTION 5.14: HARVEST-TENURE RIGHTS PROVIDED BY MOBILE GRAIN STORAGES TO REDUCE POST-HARVEST LOSSES IN SUB-SAHARAN AFRICA

What problem is the solution trying to address?

Two-thirds of unconsumed food is lost at the beginning of the food chain, between the field and the point of sale. It's left rotting in the field, spoiling in poor storage or damaged during transportation. In Sub-Saharan Africa, 40% of staple foods are lost before making it to market. Overall, a 2011 World Bank report showed that USD 4 billion worth of grain is lost in Sub-Saharan Africa each year

Food loss affects the food security and livelihoods of small farmers and small value chain actors, as well as leading to economic challenges for the greater food system. It is also a channel through which consumer access to enough quality food is impacted. Post-harvest losses also represent wasted resources (fresh water, farmland and soils, carbon emissions) used to grow food that never meets a consumer.

What, in brief, is the solution?

An Integrated Approach for Post-Harvest Loss is an "existing solution" that can be brought to scale.

The solution is a package of (1) provision of knowledge to smallholder farmers and other food system actors, (2) behaviour change communication to encourage the adoption of improved practices, and (3) sustainable business/government models to improve access to technologies and equipment for handling and storage. Supportive national agricultural policy frameworks are key elements of the enabling environment may be included in the approach.

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

World Food Programme - PHLM management programmes. To date, 93,000 smallholder farmers have participated in the WFP post-harvest programme, helping them save more food and sell more of their surplus in local markets. Six additional countries (Burkina Faso, Tanzania, Zambia, Burundi, Niger, and Rwanda) have begun rolling out the model, and seven others are in a preparation stage. In late 2017, WFP Sudan received a USD 19 million contribution to scale up operations in the next three years across the country.

How can this solution address that problem?

Great progress has been made on research and field pilots since 1990, developing a multitude of methods to reduce PHL, however adoption of technologies and innovations by smallholder farmers remains low due to many institutional bottlenecks, financial constraints, and low policy prioritization.

The solution can address the staggering amounts of post-harvest loss through:

Inputs:

- Policies supporting PHLM, including national agricultural policy frameworks that support credit and innovations to increase access to PHL management equipment.
- Analysis to understand key bottlenecks and pain points for each stakeholder
- Integrated programming for knowledge, SBCC and access to technologies – ensuring synergies with other food systems solutions
- Knowledge generation and sharing channels, practices and platforms

Outputs:

- Strengthened capacities of small farmers and value chain actors to manage PHLM
- Increased awareness of technical and process solutions by players
- Technical and financial assistance available
- Data and evidence available through coordinated platforms
- Sustainable PHL business environment

Outcomes:

- Reduction in post-harvest losses, increase in food quality
- Increased income for smallholder producers and other players

Impact:

- Improved food security
- Improved food production and steady consumption pattern
- Reduced risk of environment degradation

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

This integrated approach to reducing post-harvest losses is based on examples from WFP (as well as government, academic, and development partners) and practice in multiple operational contexts. The solution is ripe for scale. An integrated approach addresses the multiple barriers that actors face, including knowledge and skills, resources and equipment, and policy. It shifts the thinking of food systems players and incentivizes proper investment into PHLM.

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

Governments across the developing world are champions of the solution, as coalitions and unions such as the African Union. Interested in this field include the UN Rome Based Agencies (FAO, IFAD, WFP), The CGIAR, the World Bank, Africa Development Bank and several developed countries championing food waste and loss reduction

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 in sub-Saharan Africa, Latin America and Asia whose production potential is on the rise, have invested significantly in agriculture but food insecurity, reduced livelihoods and inefficient resource use continue as a result of smallholders' lack of access to technology, poor infrastructure and poor value chain linkages. This solution is not suited to active conflict areas.

What do you think are the key actions required to address this solution? Please mention the implementation approach for 3 levels, if appropriate, Public Policies, Corporate, Civil Society:

The implementation approach of the solutions needs to focus on:

- Partnerships between government, academic and non-governmental institutions to build synergies, reach the target group and ensure access to resources
- Strengthened research and evidence generation to inform programming in each context
- Technical transfer and SBCC to food system actors (small farmers and value chain actors)
- Engage the private sector to build and scale sustainable business models to serve the target group while meeting business objectives
- Knowledge generation and sharing

SOLUTION 5.15: AGROFORESTRY PRACTICES IN ARID AND SEMI-ARID LANDS

What problem is the solution trying to address?

The solution addresses particularly the problem of **food insecurity in arid and semi-arid areas** from a food systemic and holistic approach.

The solution focuses on the impact of sustainable **livestock sector** to contribute simultaneously to increase food security and health, reduce environmental impact, enhance communities' livelihoods, especially **if combined with sustainable forestry and soil management** (**agroforestry** and/or **silvopastoral** systems that combine fodder, trees, crops).

What, in brief, is the solution?

The suggested solution is the **adoption of national and international policies to promote the use of agroforestry systems** (including for example silvopastoral systems) to boost the high potential of sustainable livestock sector and agriculture, towards all the dimensions of resilience.

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

Eddy Rogerio Mauricio, member of the **Global Agenda for Sustainable Livestock (GASL),** a multistakeholder partnership of actors committed to achieve a sustainable livestock sector and boost its positive impact towards sustainable development and food systems & World Farmers' Organization

How can this solution address that problem?

This solution is based on the recognition of the **multidimensional contribution of sustainable livestock farming** for sustainable development in general, taking into consideration the multidimensional feature of the agricultural sector and the contribution it can provide in terms of economic, social and environmental development, through a holistic and pragmatic approach.

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

This solution can be a game changer because it contributes to the capacity of food systems to deal with shocks while at the same time increasing food security, contributing to animal, human and environmental health, increasing local communities' livelihoods, especially farmers' livelihoods, make food systems sustainable and resilient in the short as well as long term, strengthen value chains, it is replicable, it can have a positive impact on gender and youth empowerment among others.

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

Farmers, through their farmers' organisations, are already working on best practices to increase sustainability of the livestock sector.

Also, multi-stakeholder partnerships like GASL but also LEAP partnership, are already in place to support this approach.

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 particularly addressed to arid and semi-arid areas. However, we actually think it could be replicated elsewhere, tailored on the local context and making sure farmers first are engaged, together with all the other actors of the value chain.

What do you think are the key actions required to address this solution?

Agricultural policies must be repurposed towards social, economic and environmental positive outcomes, making sure farmers are engaged in the decision-making processes related to agriculture. Farmers are entrepreneurs, experts, food producers, the first ring of the value chains and end users of such policies, so they must be engaged and their capacities need to be strengthened if we want food systems to be effective, inclusive, resilient and sustainable.

We need to make sure the solutions we suggest use a holistic and systemic approach as food systems are complex mechanisms where all actors and sectors are interconnected, and we must address such complexity if we want to succeed.

SOLUTION 5.16: ADVANCE WIDE-SCALE ADOPTION OF AGRO-ECOLOGY WITHIN FARMS AND RANGELANDS

What problem is the solution trying to address?

The world's agriculture and food systems are the opposite of resilient. They are not presently delivering desirable outcomes on food. security and nutrition. It is also no longer feasible to look at agricultural livelihoods, food, management of natural resources and biodiversity in isolation. Agriculture, as currently practiced, is causing massive deforestation, water pollution and scarcities, biodiversity loss, soil depletion and high levels of greenhouse gas (GHG) emissions, and destruction of ecosystems that support all life. Industrial agriculture is putting today's society and future generations in jeopardy. The 2030 Agenda for Sustainable Development calls for a transformative change in agriculture and food systems to achieve multiple benefits that ensure sufficient, safe and nutritious food as well as stable multifunctional landscapes and respect for human rights. What is needed is a shift to agroecology/ regenerative agriculture. This shift is based on extensive science, as well as global practice showing that this approach enhances resilience at the local level, and across global value chains.

Key questions:

-How to operationalize agroecology/ regenerative agriculture at different scales, at different points of time, and in different contexts.

-How to measure the multi-dimensional performance of agroecology and utilize this evidence to elicit change via an enabling framework

-How to scale up agroecology/ regenerative agriculture with interested stakeholders.

What, in brief, is the solution?

The scaling up of agroecological/ regenerative approaches represents the systemic solution that underpins transformative change and supports socio-ecological transitions towards sustainable agriculture and food systems.

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

It emerged from FAO's work on agroecology and promotion of sustainable agriculture mandate, along with work on regenerative agriculture by myriad partners around the world. Following a multi-stakeholder consultative process conducted during 7 regional and 2 international agroecology meetings held between 2014 and 2018, expert reviews, and review meetings by FAO's governing bodies held between 2018 and 2019, the 10 Elements of Agroecology framework was approved to guide FAO's vision on Agroecology. The Scaling-up Agroecology Initiative was launched. The Tool for Agroecology Performance Evaluation (TAPE) was developed to provide metrics to assess of status and multidimensional progress along agroecological transitions to sustainable agriculture and food systems. The entire process was actively supported by collaborative engagement and review by different FAO Units recognizing the catalysing role that agroecology can play as a game changer in this context, building on FAO's work on the topic. Regenerative agriculture has been shown by studies from Rodale Institute, among many others, to be more productive, to be better for rural community development and essential if we are to return massive amounts of carbon in the soil. See appendix at the end for a small sample of the studies documenting the science of agroecology/ regenerative agriculture. This approach is increasingly being adopted by such major companies as Danone, General Mills, Cargill, Walmart and others.

How can this solution address that problem?

Recognizing that the inherent complexity of achieving sustainability is commonly seen as a deterrent to decision-making, FAO has approved the 10 Elements of Agroecology as an analytical framework to support the **design of differentiated paths for agriculture and food systems transformation**. This facilitates improved decision-making by policymakers, practitioners and other stakeholders in differing contexts at a range of levels on a number of scales. Biodiversity, consumers, education and governance are identified as **promising entry points** to build a structured process using visual narratives that rely on the 10 Elements of Agroecology to graphically dissect prospective social-ecological transition trajectories. **Nexus approaches** are used to highlight and examine salient interactions among different sectors and entry points, and to develop **visual narratives** describing **plausible theories of transformative change** towards sustainable agriculture and food systems.

FAO's Tool for Agroecology Performance Evaluation (TAPE) is a tool developed to assess the multidimensional performance of agroecology in order to: **Build knowledge and empower producers** through the collective process of producing data and evidence on their own practices; **Support agroecological transitions** at different scales and in different locations by proposing a diagnostic of performances over time and by identifying areas of strengths/weaknesses and enabling/disabling environment; **Inform policy makers and development institutions** by creating references on the multi-dimensional performance of agroecology and its potential to contribute to the SDGs.

When coupled together, the 10 Elements framework provides a territorial way to think about a food system which can then be assessed using TAPE (with its territorial inference and farm/household level sampling structure). Then, the evidence can be utilized and coupled with the 10 Elements framework to analyse enabling/disabling factors of sustainability and pinpoint key interventions (technical, socio-cultural, production, policy, etc.) for advancing sustainability. Both are aligned with a complex adaptive systems approach to think about, measure, and elicit changes to the food system. Both in turn, support the **FAO Scaling Up Agroecology Initiative,** which provides technical and policy guidance to countries and stakeholders to scale up agroecology.

Similarly, Savory Institute has implemented a Land to Market approach, training practitioners and equipping them with the Ecological Outcome Verification Protocol to enable them to measure and monitor progress to healthier soil, greater biodiversity, increased water holding capacity and many other metrics.

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

The fragile system of industrial agriculture has brought humanity to the brink of agricultural disaster. One bad harvest means famine in much of the world. Agroecology/ regenerative agriculture is a resilient approach that can ensure high density nutrition, abundant food supplies, rural prosperity, and carbon sequestration. It is, arguably, THE game changing solution. Its participatory development, integrated complex systems approach, harmonization with other tools and resources, involvement with a myriad of stakeholders (including other UN agencies), data-driven nature, ability to be scaled, adaptive to context variation, and actionability, make it the basis of any sustainable agricultural future.

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

FAO developed all three initiatives/tools at the bequest of member states through governing bodies and through negotiation. In 2018, Member States requested FAO to continue applying agroecology as one of the approaches to implement the five principles of sustainable food and agriculture in support of the SDGs and to

assist countries and regions to engage more effectively in the transition processes towards sustainable agriculture and food systems

Members of the Committee on World Food Security are discussing policy recommendations on "Agroecological and other innovative approaches for sustainable agricultural and food systems that enhance food security and nutrition", to be concluded in 2021.

The Scaling up Agroecology Initiative brings together different UN Agencies and stakeholders to catalyse scientific evidence, knowledge and cooperation to support agroecological transitions at different levels (World Food Programme, International Fund for Agricultural Development, Convention on Biological Diversity, UN Development Programme, and UN Environment Programme, World Bank).

The Transformative Partnerships Platform (TPP) launched by France (CIRAD) and the CGIAR (ICRAF), is intended to boost the amount of evidence available on the impacts of agroecological approaches to building resilience of livelihoods and landscapes across a wide range of different contexts.

In 2019, The German Parliament approved a decision to mainstream agroecology in its development cooperation programmes.

For more detail on different governments and Non-state actors implementing agroecology, please visit http://www.fao.org/agroecology/home/en/

As mentioned above, the shift of major food companies to regenerative agriculture is a sign of the scalability of this approach.

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 10 Elements of agroecology framework and TAPE both recognize that options need to be adapted to contexts hence the centrality of **co-creation and sharing of knowledge** to generate robust evidence to support decision making across transitions towards sustainable agriculture and food systems in different contexts.

Regenerative agriculture can be scaled from small holder farmers to large industrial operations, as General Mills is now doing on more than a million acres. Similarly, Cargill. McDonalds, and other are implementing this approach on another million acres. The Savory approach is now used on more than 13, million hectares on six continents.

What do you think are the key actions required to address this solution?

Public policies:

In order to face the agriculture and food systems complex and multidimensional challenges, policies should:

i. embrace a long-term perspective and holistic approach of the kind embodied by the 10 Elements of Agroecology framework which guides FAO's vision on Agroecology as one of the ways to promote sustainable agriculture and food systems.
ii. promote diversification in agriculture and food systems in order to reduce vulnerability to an increasingly changing climate and economic shocks.
iii. strengthen the adaptive capacity of rural livelihoods, by encouraging co-creation processes that combine technological innovations with local knowledge, experience and valuable practices in the context of new marketing networks and the responsible governance of land and natural resources.

iv. encourage integrated measurement approaches, such as TAPE, TEEBAgriFood, Ecpologiocal Outcpome Verification amd others in order to capture all the factors that contribute to sustainable agriculture and food systems.

To implement the proposed solution it is important to highlight that these initiatives/tools complement each other. The 10 elements of Agroecology provide the framework for the redesign of the current food and agricultural system to make it more sustainable across all dimensions and with different entry points; the scaling up initiative support the incorporation of this framework into policies to support the transition to agroecology, promotes sharing of knowledge and innovations, while strengthening and building connection for transformative change of the food and agricultural systems in support of the SDGs; the Tool for Agroecology Performance Evaluation TAPE, provides concrete, systematic and relevant data of the current state of the food system, making direct links to the 10 elements of Agroecology, the enabling and disenabling environment for agroecology and the SDGs indicators, to inform policy makers about the performance of agroecology across different dimensions, taking into consideration the specific context of territory/country, identifying gaps in the system that can be addressed holistically with these policies, promoting concrete actions and a participatory decision making process with participation of all actors in which Civil Society actions play a major role.

SOLUTION 5.17: LOCAL AND PUBLIC PROCUREMENT SCHEMES SPECIFICALLY TARGETING SMALLHOLDER FARMERS AND SMALL AND MICRO/SMALL/MEDIUM-SIZED ENTERPRISES TO PURCHASE FOOD WITH SPECIFIC CHARACTERISTICS (I.E. LOCALLY PRODUCED, PRODUCED BY WOMEN'S OR YOUTH COOPERATIVES, ORGANIC, SEASONAL)

Institutional Demand Driven Transformation – Leveraging local procurement for systemic value chain change

Procurement funds (from public and private actors) incentivize value chain transformation by providing a secure or facilitate market to smallholder farmers and small and micro/small/medium-sized (MSMEs) in the value chain. However, many such models fail due to challenges in the value chain (sourcing from farmers NOT already linked to markets, sourcing crops normally grown in small quantities and at local sale prices for a production line that depends on high consistent volumes, etc) and need to be complemented by in-the-value-chain interventions to address challenges that small actors face in engaging equitably with larger actors in local food systems. Consumers benefit by increased availability of safe and nutritious foods.

Shifting local value chains is an accelerating process, difficult at first due to needed skills, process and capital upgrading. However, spill-over effects and lower barriers lead to greater levels of investment for equitable, healthy and sustainable supply chains.

What problem is the solution trying to address?

Local food value chains are at the center of sustainable food systems, but they are often not fair, transparent, or sustainable. Profits and margins are not efficiently distributed, and the farmers (often with the least power in the chain) do not receive a fair share of the value produced.

Similarly, micro, small and medium-sized enterprises (MSMEs, which make up the majority of firms in the world and are responsible for a large portion of its employment) suffer high transaction costs, tight margins, and barriers to greater investment and scale. In the absence of assured markets, potential MSME entrants do not find returns attractive enough to enter the value chain. This situation prevents small farmers and value chain participants from improving their economic conditions and livelihoods, and ultimately hampers the development of sustainable food systems.

Finally, due to reduced functionality of supply chains and limited supply, consumers face higher prices and greater safety risks for nutritious food for healthy diets.

What, in brief, is the solution?

To systematize and scale institutional demand (public and private) and local procurement strategies (complemented by in-the-value-chain-interventions) to incentivize the transformation to more equitable, sustainable local supply chains.

Large buyers of food at the local level – both public and private – can leverage their purchasing power to strengthen local value chains (reduce risk, set standards, develop skills, and smooth transaction costs) and promote fair and transparent relationships among the different players.

Actors may deploy specific purchasing principles, criteria and tools to safeguard the interest of the weakest players along the value chain and strengthen their agency and bargaining power. These strategies maximize the multiplier effects of the funds injected in local economies by strengthening the resilience and capacities of smallholders and small and medium agricultural enterprises (SMEs) along the value chain.

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

This solution emerged from the World Food Programme's experience with local and regional procurement. A corporate Policy approved in 2019 with the objective to leverage WFP's purchasing power – roughly US$ 800 million per year – supports the development of fair and equitable value chains and increase the supply of nutritious institutional food in various contexts.

Why is addressing that problem important for achieving the goal of your working group?

Stable, institutional demand from governments and diverse organizations offer an opportunity to utilize funds for multiple resilience-building objectives. A guaranteed/facilitated market for smallholders and MSMEs is a game-changer that can trigger positive behaviour and business model changes to drastically transform the way the whole value chain works – while building resilience capacities (resources, knowledge, skills, network) to better withstand shocks in the future.

Demand-led development approaches (supplemented by supply-side value chain work) complemented by an enabling environment combines for a multi-level integrated approach to achieve equitable and sustainable food systems.

How can this solution address the problem?

Farmers and MSMEs in the value chain do not adequately benefit from local supply chains - they do not receive a fair profit share while simultaneously are forced to take a disproportionate share of the risk. Root causes for why value is not efficiently distributed include power dynamics, infrastructure issues, access to resources and information, and policies that are often not pro-farmer or pro-MSME.

The **input**: As a first step, a value chain assessment is needed to analyse the contextual and operational conditions of the value chain (including *who* forms the chain) and informs subsequent procurement strategies and complementary in-the-value-chain interventions. For many actors, a feasibility study and business case will also be necessary. The results of these analysis recommend two sets of actions:

> **1. Procurement Strategies**, the large buyer deploys pro-SHF and pro-MSME contract modalities targeted to promote benefits to smallholder farmers and MSMEs (e.g. direct purchases from small farmers organizations or indirect contracts with local traders with sourcing requirements, and specific conditionalities such as minimum price, payment conditions or targeted groups)
> **2. Value Chain Interventions**, a set of programmatic interventions to tackle the root causes of inefficiencies and support the long-term sustainability of the transformation (enabled by stable market access). Those interventions should be targeted at supporting the production of smallholder farmers, strengthening the capacity of other key value chain actors (farmers' organizations, traders, etc.) and improving the broader enabling environment of the targeted value chain.

Outcomes are achieved both at individual and system levels through interventions in the value chains to address the root causes of the identified inefficiencies.

At individual level, the value transmission to farmers and individuals working in harvest, production, processing and transportation improve. The volume and quality of the produce increase as well. This leads to an overall increase in the value of production and sales, which in turns leads to improved livelihoods, improved food quality and food security.

At system level, the interventions improve market performance of all value chain actors and enhance local markets functioning, food availability and quality. Associated with an increased private sector engagement, an overall improvement of the value chain efficiency is achieved.

With targeted interventions, issues of inclusiveness (leaving no-one behind), climate resilience and nutrition may also be addressed by incentivizing needed changes and working with actors to make the shift. Furthermore, farmers' agency and bargaining power are being strengthened throughout the process, a pivotal component for addressing both the root causes and building the exit strategy; that is, to guarantee long term sustainability of the results.

It has also been shown that farmers and MSMEs operate in several value chains with different buyers simultaneously. It is possible to harness the profits and skills learned from one value chain to other markets for greater livelihood opportunities. (Navas-Aleman, 2011).

Risks and challenges:

- Traceability and monitoring tools are necessary to provide the transparency required using pro-SHF and pro-MSME contract modalities. Putting in place these tools may be challenging in some contexts.
- The consequence of using the pro-SHF and pro-MSME contract modalities is that profits and margins will be redistributed. With that, resistance to change is expected from some of the players operating in the value chain.
- Strong partnerships are required to develop and implement the programmatic interventions. Once the value chain conditions are mapped, coalitions of multiple stakeholders must be built and kept operative in the long term.
- If planning and price determination of the local procurement is not adequately informed by market intelligence, there is a risk for local market distortion.
- Impact is not seen immediately. Entities need to plan for the medium and long-term.

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

This solution operates at the ecosystem level and improves food systems resilience by transforming prevailing conditions that are unfavourable to smallholder farmers and MSMEs, and ultimately impede the development of sustainable local food value chains.

It fulfils the three criteria for a game changing solution as follows:

- The potential impact is high as it can be adopted both by public and private sector buyers – WFP alone purchases roughly US$ 800 million every year at local and regional level, mostly in low income countries.
- It is actionable because it improves the overall functioning of the value chains and potentially brings benefits to all value chain actors, from the final buyer to the traders to the farmers.
- Different from interventions that focus exclusively on the farmers, the integrated approach of this solution is intended to shift current conditions to a new state that is economically feasible to all value chain actors. The promotion of equitable agency power and trust among the actors underpin the exit strategy and hence the sustainability of the solution in the long run.

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

Many donor countries show interest in the idea of using the organizational purchasing power to the benefit of local economies and local value chains. As an expression of this continued interest, the WFP's corporate policy on Local and Regional Food Procurement (mentioned in item 2.3 above) was requested and approved in 2019 by the WFP's Executive Board with strong support from all the state members. Since then, the Board has been closely following up on the policy implementation.

This solution is closely related to e-commerce, home-grown school feeding, gender empowerment strategies, and may also be included in a coalition of support.

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 highest impact for this solution be in low/medium income countries and in value chains that are long (large buyer does not have close connection with farmers) and loose (unstable and volatile connections among the players in the chain). Cereals, pulses and other staple foods in Africa and Latin America are typical chains of this kind. However, there are significant gains to be realized by considering this model for high-value horticulture and nutritious foods production.

This solution is not well-suited to conflict environments. Governance levels need to be strong enough to enforce contracts.

What do you think are the key actions required to address this solution?

The initial action is to fully understand the contextual and operational aspects of the considered value chain. For that, a value chain assessment is a recommended approach and can be performed either directly by the buyer or by a knowledgeable stakeholder such as a local academic institution.

If the buyer is a public entity, specific policies may be needed to regulate specific procurement conditions.

If the buyer is a private entity, long-term planning must be considered as impacts are not immediately seen.

In addition, programmatic interventions should be planned to address the identified value chain bottlenecks. At this point, a coalition of interested stakeholders becomes necessary depending upon the specific bottlenecks (infrastructure, food safety, training, etc) including the private sector players (including the buyers themselves), government institutions, academia and ideally with the participation of the local civil society.

SOLUTION 5.18: UNIVERSAL FOOD ACCESS: ENACTING FOOD AS A PUBLIC GOOD.

Valuing food, not as a commodity, but as a public good and human right based on the absolute essentialness of food to every human every day. Applying the same rationality that we use with health and education to food.

What problem is the solution trying to address?

The dominant narrative of the Global Food System is that food is a commodity (a for-profit product) and thus the market is the most appropriate mechanism to allocate this essential resource. With this valuation (nothing but a social construct), those who have no money (or not enough) cannot get access to sufficient and nutritious food. Therefore, poverty in cash or means of production equals to food insecurity. Those who cannot afford will be covered by humanitarian assistance or food charities. But food is a vital resource for ever human being, every day, regardless culture, age, sex or wealth conditions. As there is no scarcity of food (the world produces enough food to feed 10 billion people), the dominant market mechanism is failing to allocate adequately the food produced to all the needed people (the entire humanity).

In the XX century, two other essential human needs (health and education) were enacted (valued + governed) as public goods and entitlements. And in many countries, there are universal schemes for education (at least until 14 years) and health (to cover medical treatments, surgeries, emergency assistance or medicines), usually as specific institutional settings combining public support and infrastructures with private services and infrastructures. Regardless of the institutional setting, the primary goal of both schemes is to guarantee a minimum access to education and health to every citizen.

Why not applying the same rationality to food? Why not a Universal Food Access scheme that, combining public policies and infrastructures and private institutions and actors, can guarantee a minimum access to enough and adequate food to all, regardless of their purchasing power, every day.

What, in brief, is the solution?

Inspired by the "*Universal Health Coverage*" and "*Education for All*" schemes, the "*Universal Food Access*" is a policy innovation, grounded in a game-changing framing of food as a public good and a vital resource, whereby everybody would be entitled to get a minimum access to adequate food every day, regardless his/her purchasing power and guaranteed through different public, private and collective means. These schemes would take different shapes in different countries, to be anchored or not in legal provisions, and should be attained progressively. The political innovation could be applicable to every country, regardless its wealth or food security status, as is grounded on the universal and absolute need to eat. That scheme could accommodate any type of food security policy, both universal and targeted ones, for-profit or public, as long as there is no one left behind hungry. It would be an aspirational and inspirational conceptual framework that departs from the current "no money-no food" rationale and that could dismantle many "lock-ins" associated to the for-profit allocation mechanisms.

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

Food has been considered as a public good (subject to public policies, governmental support and tight control) for most part of human history. It was only during the last centuries that specific food crops started to be considered as commodities (only traded for profit maximisation) by the colonial powers (coffee, sugarcane, spices). Now, those crops have been replaced by corn, wheat, soybean, palm oil, coffee and sugarcane.

Commoditised food is often considered as a "strategic good", allocated through market mechanisms but heavily subsidised in most countries. So, not exclusively left to market mechanisms. That can be considered

as a tacit recognition of its public utility. Why not shifting from a tacit to an open recognition as a public good for the commonwealth of the entire humankind.

This Summit could become the starting point of a global debate to reframe food differently, from a pure commodity to a public good. Once the normative valuation changes, a whole array of new policies (innovative and so far unpermitted) could be designed and implemented.

What is the 'theory of change'?

The first and main input is a political declaration, later on anchored in legal provisions, to value and enact food as a public good. This move could be based on previous national debates, a consensus-building dialogue, positioning documents and pre-negotiations. Framing food as a public good will take some time.

Then, this frame could accommodate many ongoing initiatives/policies (doing things differently) complemented with new policies and actions. For instance, expand/scale up the coverage of ongoing activities (i.e. home-grown school meals, food-based and cash-based safety nets, assets creation programmes to be reframed as Employment Generation Schemes that are undertaken at massive scale to increase landscape, community, household and individual resilience), thus enabling several ministries at country level , UN agencies and CSOs to become relevant actors in policy advocacy within "Country Capacity Strengthening" schemes.

Type of actions that could implement the Universal Food Access

1.- Universal Safety Nets (either cash-, voucher-or food-based), based not only on humanitarian needs but on entitlements as well. The cash-based safety nets would enable beneficiaries to source appropriate, diverse foods (or any other basic need) themselves from local markets. Conditional and Unconditional Cash Transfers

2.- Employment Generation Schemes (food- or cash-for-work schemes could be reframed from emergency assistance to employment generation schemes): we contribute to generate more employment for poor, food insecure. un-skilled people, either temporary or stable, with specific goals related circular economy, green economy, climate shocks resilience or infrastructure development (to reach last miles where the State cannot reach).

3.- Healthy and nutrient-rich diets could become accessible to all (not just through purchasing power), guaranteed by state mechanisms, with a (regulated and growing) private sector that is geared towards that goal. So far, most efforts in fragile states have been geared to increase the supply of calories. However, diets based primarily on staple cereals or tubers lack diversity, which contributes to micronutrient deficiencies. Thus, much greater effort on enabling access to Healthy diets is required. Moreover, cooperatives, customary indigenous systems and contemporary alternative food networks (i.e. community supported agriculture) would also be a fundamental part of this scheme. So, in a gradual approach, firstly everybody should be guaranteed access to an energy-sufficient diet, and as a second step, access to a dietary-adequate diet. So, the "Fill the Nutrient Gap" initiative would be extremely relevant here.

4.- Home-grown School Feeding would be transformed into a universal programme, as an additional entitlement every child has by attending school. If "eating" is as equally important as "learning", both should be provided to all students in all schools. So, that would mean transforming school meals programmes based on voluntary humanitarian or developmental aid into universal school meal schemes to be supported by public budgets (with external support from WFP and other donors/UN agencies).

5.- Shock-responsive Social Protection (Forecast-based Early Action, Weather-related Insurance Schemes, Risk Sharing Initiatives)

6.- Nomadic Livestock Economies (for self-consumption and trade) that inhabit remote, sparsely populated fringe areas, usually moving in cross-border itineraries.

7.- Scaling up local food procurement to benefit smallholder farmers: Smallholders feed the world. Institutional demand for food and food system services can be a direct and indirect driving force towards building sustainable and inclusive food systems, contributing to inclusive agricultural growth and sustainable social and economic transformation. Local procurement, including pro-smallholder procurement, can significantly strengthen smallholders' livelihoods and the sustainability of food systems, particularly when it is associated with activities that support value chain actors. It also improves the availability, quality and safety of food for the community.

8.- Food reserves: Support national governments with the management of reserves and monitor countries' food reserves as an indicator of an upcoming food crisis.

9.- Food Banks to be part of the UFC as State-run institutions, based on entitlements, that could be complemented by not-for-profit private institutions such as charities, religious institutions or philanthropic foundations.

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

This policy innovation, that brings a new conceptual framework, can be a real game changer in the way food security and food systems are approached. At present, the dominant narrative about food systems and hunger eradication is articulated around "affordability". Affordability means that food, as a commodity, shall be affordable, because only through market mechanisms is food allocated. And to be affordable, (a) either you increase people's purchasing power (what has proven to be difficult, and it can be counterbalanced by incomes and prices rising in parallel thus keeping purchasing power equal), or (b) you cheapen food prices, with all the social and environmental consequences we already know: low farm gates prices, enslaved temporary workers, non-accountable environmental damages, forest clearances, wasted food because it doesn't fit cosmetic requirements, and huge subsidies to food corporations to maintain. When we refer to health and education in public policies, we do not use the term "affordability" because we all work under the value-based narrative of education and health as public goods, human rights and people's entitlements

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

This is a disruptive shift, moving the core debate away from "affordability" to "entitlements", providing a narrative that could be understood by everybody (from an illiterate pastoralist to a prime minister).

Although implemented as such in no country to date, there are several countries that have already included the right to food in their Constitutions or legal frameworks (Guatemala, Nicaragua, Bolivia, Venezuela, Kenya, Nepal) and those countries are implementing policies and programmes that could be identified as "conducive towards a Universal Food Access". Moreover, big national food assistance programmes, such as the Supplemental Nutrition Assistance Program in USA or the Fund for European Aid to the Most Deprived (FEAD) in EU countries, are good examples in that direction. However, those programmes do not consider food as a public good and they are just targeted policies to provide access to food with strict criteria of poverty, subject to political games, poor accountability and non universality.

The key element of the Universal Food Access is to combine different measures (public and private) to secure that food daily needs are covered for every citizen. So, coverage, eligibility, complementarity or universality are key features of this scheme.

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

As everybody needs to eat every day, wherever and whatever the circumstances, this solution perfectly fits every country. In some of them, the implementation will be faster (more means, less food insecurity situation, stronger state institutions) and in others it will take more years, but it can be implemented gradually: extending current programmes from specific groups or areas to universal coverage, complementing programmes to cover food needs by cash, in-kind, guaranteed employment, public premises to distribute food (food banks, public bakeries), public procurement, etc

What do you think are the key actions required to address this solution?

This policy innovation could accommodate several products and evidence-based practices proposed in the five Action Tracks and expand/scale up the coverage of ongoing activities (i.e. home-grown school meals, food-based and cash-based safety nets, assets creation programmes to be reframed as Employment Generation Schemes that are undertaken at massive scale to increase landscape, community, household and individual resilience), thus enabling several ministries at country level , UN agencies and CSOs to become relevant actors in policy advocacy within “Country Capacity Strengthening” schemes.

Key actions: It is important to enact this normative valuation of food as a public good in the legal framework of the countries that are willing to do it (either as a constitutional provision or lower-level laws). Governments and civil society movements could also establish “complaint and redress mechanisms” to render accountability effective. Several actions undertaken so far by unaccountable voluntarism (i.e. Food Banks, humanitarian assistance during shocks) or covering just a minor share of the population (school meals, cash/food for work) would be supervised by the States, public policies and adequate subsidies would be diverted from food commodities and their coverage would be enlarged.

Corporate sectors and collective actions would have to be bound by stricter public policies that should protect the adequate food security of all. When private markets cannot satisfy food for all, the state and self-regulated collective actions should act to cover the gaps. For every person, every day. Moreover, through policies, regulations and refocusing subsidies, the private sector would be disincentivized to produce food commodities that are harmful for the environment, meant for livestock feeding or just empty calories, and they would be steered to produce nutritious food needed by human population.

This process will take time, so CSOs could be instrumental in advocating for this gradual transition towards this Universal Food Access scheme.

SOLUTION 5.19: ENRICHING CHILD'S FOOD & NUTRITIONAL EDUCATION AND SITUATION THROUGH WEB-BASED TOOLS, INCLUDING FOOD INTO THE CURRICULA, AND PROVIDING SCHOOL MEALS.

What problem is the solution trying to address?

Food illiteracy is at the basis of unhealthy and unsustainable individual and collective choices that compromise the resilience of human and planetary health. These include both dietary choices, handling of food waste and choices on farming practices and the management of food production landscapes.

Research shows that only the combined effects of positive changes in all these fronts will be able to put current food systems within environmental limits that don't compromise social-ecological resilience (Springmann et al 2018). But many of these unsustainable and unhealthy habits are difficult to transform as they are embedded in social norms and regional food cultures (REF). Thus, to achieve positive change we need to shift mindsets and value systems. These are long-term transformational goals and education and knowledge from an early age on what constitutes a healthy diet, and on different sustainable management practices of food production landscapes, are key features in this process.

What, in brief, is the solution?

To mainstream healthy food habits, from diets to production practices, we need to embed that knowledge on child education from an early age. Although adult education is important for accelerating short term action, the mind shift required for such systemic transformations demands a longer-term investment in those who will be the adult consumers and leaders of the future (Willet et al. 2019).

School programs in all regions of the world should be adapted to include knowledge on:

- The practices that sustain food landscapes that are environmentally sustainable and able to support local livelihoods while celebrating the value of local food cultures.
- Nutrition and what consist a healthy diet adapted to the local culture;
- The value and the importance of preserving diversity of foods at all scales of the food system, from the local scale to the thousands of crop varieties and wild foods at the planetary scale.
- How individual food choices can affect large scale transformation, and how each person can be part of a positive change

Additionally, schools should:

- Ensure that school menus have a high nutritional and sustainability standard (healthy food, as locally produced as possible with low amount of inputs)
- Use school gardens to produce food for educational purposes through sustainable practices. (if this is not possible, collaborations with, for ex. Pedagogical farms can be fostered to expose children to the kraft of farming)

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

Google form (further supported and enriched through literature sources and practical examples).

How can this solution address that problem?

Children educated in sustainable and healthy food systems from an early age are better equipped to make better food choices. Educated children can foster innovative ideas for transforming farming practices, become responsible consumers and stewards of sustainable and healthy local food environments and cultures.

This solution includes not only the transmission of theoretical knowledge but also learning through practice and exposure. School meals are a leverage point to both ensure the appropriate nutrition to school children from all social groups while at the same time promoting healthy food habits from an early age. Raising the sustainability and health standards of school meals can also be used to achieve other synergistic goals such as locally produced food, promoting organic farming, etc. Examples from places like Brazil and Denmark show how public policies targeting school meals have driven transformational change in the local and regional food production system, (Colombo et al. 2020; BMJ 2019; Hansen et al. 2010). School gardens or pedagogic farms provide also an opportunity for children to "learn by doing", understand where does food come from and the basic principles of sustainable farming and local food cultures, as well as and experience the mental and physical benefits of producing local and sustainable food (Dyg and Wistoft 2018; Wolsey and Lapp 2017).

Experiences with school programs with focus on food health and sustainability show that public procurement can be an effective tool to implement such initiatives in schools. State (National education Boards for ex), municipality actors and school principals are therefore the main key change-agents in this solution.

Teachers and staff from school kitchens need specific training on how to integrate knowledge on food systems sustainability and health in their daily work. Teachers need pedagogical tools that allow this integration and kitchen staff will need support to compose more sustainable menus that are also nutritionally diverse.

One of the challenges/risks with this initiative is that in the shift towards healthier and sustainable food, the supply systems in place (ex. local organic farms) cannot deliver the volume of food needed to support the initiative. This was a problem identified in previous cases.

Another aspect is that educational systems in different regions/countries differ in their investment capacity. The risk being that less favored areas aren't able to put the necessary resources in place (training staff, changing school programs,etc) to out this solution in practice, which in the long term can increase the knowledge gap among different countries/society groups even more. Therefore, educational efforts shouldn't be limited to formal education. Civil societies and informal actors might have a key role in spreading this knowledge through different channels.

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

1) A mindshift on the way we consume and produce food towards more sustainable and healthy habits has the potential to contribute to systemic food systems transformation from the local to the global scale. Educating the children of today, will contribute to a next generation of consumers and producers whose values and behavior are aligned with the health and sustainability targets for food systems.

2)Investments in education can be costsom as rigidity is often a trait of most educational systems. However, examples such as the city of Copenhagen that within a few years time succeeded in making 90% of the food served in public in school kitchens coming from organic production, show how public procurement can be effective in changing the rules of the game within a short time period.
National governments and municipalities have the mandate, and in many cases the capacitym for a direct implementation of such changes in their respective school systems. Thus, this is an actionable solution with well identified policies and key actors.

Still, the replication of examples such as the one described for the city of Copenhagen might be challenging in regions where resources to the educational system are scarce in countries where institutions are weak. In those cases intergovernmental organizations and the civil society sector can play a crucial role in filling providing the support mechanisms to the implementation of this solution in less favored regions (qualified training of school staff, ensure the availability and better access to healthy sustainable food, etc)

(3) Investments in education and changes in values and behavior are actions with a long-time horizon that would likely deliver outcomes beyond 2030.

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

The World Food Program is a strong supporter of using school meals as a way of improving nutrition and educating children on the benefits of sustainable and healthy food choices

Stakeholders implementing this type of solutions:

- The EAT-C40 Food Systems Network is a collaboration between the EAT foundation and the C-40 network Cities Climate Leadership Group that supports cities to accelerate action in order to reduce greenhouse gas emissions while enhancing urban food system resilience. One their main action tracks is the Sustainable Diets and Procurement – which includes using food procurement for public schools' canteens to foster more sustainable and healthy diets.
- The city of Copenhagen Food strategy, which includes the use of public procurement to embed food health and sustainability in public schools https://www.kk.dk/sites/default/files/uploaded-files/the_city_of_copenhagen_food_strategy_2019.pdf
- The Brazilian School Feeding Programme uses school meals as a leverage point for increased nutrition and food security, knowledge and learning on food systems sustainability and health, while at the same time supporting family farms https://www.researchgate.net/publication/233876347_The_Brazilian_School_Feeding_Programme_an_Example_of_an_Integrated_Programme_in_Support_of_Food_and_Nutrition_Security
- https://thesolutionsjournal.com/2016/02/22/the-local-food-revolution-in-brazils-schools/

Similar initiatives have been successfully implemented in other countries such as Japan https://www.barillacfn.com/en/magazine/food-and-society/japan-shows-food-education-works/

https://www.devex.com/news/what-lessons-can-countries-learn-from-japan-on-school-meals-96198 and Italy: http://www.citego.org/bdf_fiche-document-1329_en.html

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 suited to be implemented worldwide, but should be particularly prioritized in countries with high levels of obesity and countries with high levels of food insecurity, and where the gains of nutritious and healthy school food would really make a difference for child food security.

What do you think are the key actions required to address this solution?

1. Use public procurement to embed food systems literacy in school pedagogic programs, raise the nutrition and sustainability standards of school meals and increase the exposure of children to the ways of producing and processing healthy and sustainable food (through school gardens; cooking lessons, etc)
2. Intergovernmental organizations and civil society organizations are instrumental to the implementation of this solution in countries/regions where resources for investment in education are scarce or/and institutions are weak.

SOLUTION 5.20: ADAPTIVE HUMAN-CENTRIC APPROACH TO RESILIENT AND SUSTAINABLE WATER MANAGEMENT

What problem is the solution trying to address?

Food production and food security are highly vulnerable to water-related risks, including those associated with access to safe, high quality and sufficient water, and sustainable water (re)use levels. Climate change is compounding these challenges. Hydrological variability and extreme events, such as droughts and floods, are exacerbating already water stressed situations, and making more complex the distribution of resources across competing needs (e.g., agricultural and WASH). Pandemics such as COVID-19 further add to these vulnerabilities , especially as people struggle with water insecurity and unreliable food access. Finally, the use of untreated, partially treated or diluted wastewater occurs downstream of urban areas in four out of five cities in the developing world and is usually driven by farmers' lack of alternative water sources and/or search for nutrients.

Many recent publications from UN and various critical thought leaders have emphasized the need to support farmers to help manage climate risks and build resilience. Building resilience in a changing climate requires us to revisit *how, where and when* we (re)use water for production of healthy foods. Addressing water scarcity requires ways to store more water as we grow our food, find innovative financing to water access and incentivize sustainable use of water within our food system in an equitable and inclusive manner.

It requires us to address issues of physical water and economic water scarcity simultaneously and tackle challenges of too little and too much water use and degrading water quality. The multiple barriers to agricultural water management and multi-purpose self-supply arises from lack of coordination across actors, sectors and scales. The stressors and the risks communities face are diverse and highly contextual – likewise, interventions that intend to build resilience to these conditions need to be tailored to local conditions and needs.

What, in brief, is the solution?

Tackling the aforementioned water related risks within the farmer-led irrigation development sphere would provide opportunities for actors and stakeholders to come together and tackle challenges of both physical and economic water scarcity, resilience, and sustainability within our food system and multi-purpose self-supply – informing action that is intended to be inherently significant to the local context, and tailoring to the individual, communal and societal needs (including marginalized groups and women)

Farmer-led Irrigation development is conceptualized as '…a process in which farmers, individual and/or group, drive the establishment, improvement, and expansion of irrigated agriculture, often in interaction with other actors' (WB, 2018). Unpacking the definition:

Drive the establishment: Farmers invest or capitalize upon technologies in storage (i.e. water harvesting ponds, small reservoirs, underground storage, managed aquifer recharge), accessing (i.e. manual or motorized electric, diesel, solar photovoltaic pumps, river diversion) and using (i.e. drip, sprinkler, furrow) water for different agricultural value chains including animal and aquatic sourced food as well as water-sanitation and hygiene. These are areas where rainfed agriculture advances along the rainfed-irrigation continuum with different modalities of irrigation (i.e. supplementary irrigation, residual moisture cropping, full irrigation)

Drive the improvement: Farmers are found to re-invest into irrigation and agriculture by upgrading irrigation technologies (e.g. agrovoltaics, hydrophonics), agricultural inputs and move from staples to high value crops such as vegetables, fruits. Improvements do include for example climate smart agriculture, regenerative agriculture and increased moisture storage, moving from furrow to drip irrigation, moving to precision application, weather, irrigation and agricultural advisory services, reduce drudgery etc.

Drive the expansion: Farmers tend to diversify their cropping systems, bring more land into irrigation. The commercial logic of FLI development influences also the investment into improved seeds, fertilizers and strengthen reliability of high value crops (vegetables, fruit) all year around strengthening local food and nutrition security even in terms of a pandemic.

Conjunctive and alternative water use: Depending on the available water source, farmer-led irrigation development is found next to rivers, small reservoirs, poorly functioning irrigation schemes, shallow and deep wells but also the use of unconventional water sources (i.e. recycle and re-use) is gaining momentum in water scarce areas

What does farmer-led irrigation entail: Farmer-led irrigation development is a bundle of water centric solutions related to storage, access and (re)use in agricultural production systems translating in bundled solutions tailored to the local context (i.e. natural resources availability, socio-economic, climate) the individual or a small community of smallholder farmers (< 10 ha) are situated. Making the water solutions sustainable and equitable requires policy and institutional solutions coordinated across multiple sectors (agriculture, water, energy, finance/economy) and multiple actors (public, private, research), notably through multi-stakeholder engagement processes to jointly address barriers that occur at different scales whilst enhancing governance, integrated water resource management and food system transformation.

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

Farmer-led irrigation has been gaining momentum over the last decade following funding from Bill and Melinda Gates Foundation called Agwater Solutions (2008-2012), the 2017 Water for Food International Forum event held in Washington DC, Daugherty Water For Food Global Institute (DWFI) and the Farmer-led irrigation flagship event at the 2018 Africa Green Revolution Forum (AGRF) in Kigali Rwanda. Results from IWMI's Agwater Solutions project have informed several new initiatives over the past 8 years (2013- Present) in sub-Saharan Africa such as the Innovation Lab for Small scale irrigation funded by USAID and Studying African farmer-led Irrigation program funded by the Economic and Social Research Council (ESRC) and the Foreign, Commonwealth & Development Office (FCDO). African Union Commission (AU) has identified FLI (pillar 2) and unconventional water use (pillar 4) as two out of the 4 pillars in the Framework for Irrigation Development and Agricultural Water Management (IDAWM). Leading up to the UNFSSS, Bold Actions for Food as a Force for Good, Pre-event in support of the UN Food Systems Summit 2021 held a session titled "Achieving Duality of water savings and food security by transforming value chains"

Since the last 4-5 years FLI has been gaining attention in the international development community, regional economic communities, national governments, and private sector as a game changer to build resilience in Sub-Saharan Africa and Asia. For example, private sector initiatives and investments bring innovations, expertise, resources and new business perspective (e.g. solar powered irrigation, PAYGO services) to farmer-led irrigation (e.g. WE4Fhub) and WASH benefiting different societies and addressing different water challenges. For example, a case study by the Self Employed Women's Organization (SEWA), a trade union of 1.5 million poor women workers with land sizes between 2 to 5 acres have adopted a mixed-grid approach of solar powered energy to address challenges in irrigation and WASH resulting in cost saving for irrigation, increase in cultivated area whilst reducing water wastage, reduction of labor and drudgery and asset creation.

How can this solution address that problem?

As stated in section 2.2, farmer-led irrigation encompasses the establishment, improvement, and expansion of irrigation and therefore water access and (re)use. Hence, FLI development is a process which enables contextualized and demand-driven water access and management. While it is not a single solution or 'silver bullet', the process occurs across nested scales to respond to technical, social, and institutional needs in irrigated production. It needs contextualization, adaptation to local context(s) and collaboration between private, public or communal actors and stakeholders within the irrigated agricultural value chains and the food system more broadly to catalyse investment to overcome water related risks as well investments to enhance sustainable water (re)use in our food system and multi-purpose self-supply. It requires functional input and output markets, enabling policies, upstream and end-user financing in bottom of pyramid market segments and good, inclusive governance. The latter is important to build resilience and to prevent further widening of existing inequalities related to water access, agricultural livelihoods, land, and water tenure. Women and resource-poor farmers are particularly disadvantaged in accessing natural resources (land and water), financial mechanisms, information and exhibit limited integration into markets. Hence, scaling approaches and principles to FLI development within the food system will require addressing gender and social inclusion gaps in technology development and access, financial access, market systems, water-energy-agricultural- climate change policies, institutional and governance structures strongly embedded in a sustainable water resource framework.

Inputs required to unlock the potential of FLI development at scale centres around the following 5 key components:

- *Strong agricultural financing* ecosystem: Strengthening finance access across the agriculture finance ecosystem and ensuring financing options are available for end-users of FLI bundles. This requires addressing gaps in suitable end-user financing for women and vulnerable groups (e.g. bottom of pyramid markets).
- *Appropriate/available best-fit tech:* Bundling of best-fit technologies and services along the storage-access- (re)use continuum tailored to the specific agricultural, animal, and aquatic food chains, integrated within local food systems as well as responses to and resilience from climate change impacts. This requires a gender and socially inclusive approach to technology preferences, information access and control over assets. Developments combined with climate data services supports farmers responding to forecasting, facilitates government response during extreme events to help farmers recover.
- *Multi-stakeholder/actor cooperation:* Strengthening alignment and coordination of public, private, research, and development actors to move together along the scaling continuum, fostering interactive learning and building institutional capacity to facilitate systemic change and inclusive outcomes.
- *Enabling environment:* Guiding legal and policy frameworks to enhance governance of natural resources, economic, social, and natural impact – to promote resilience across the board.

Monitoring and management: 4IR and innovative solutions to understand water consumption behaviour, water (re)use across scales, sectors and users.

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

Farmer-led irrigation development has the potential to reduce existing water insecurities and inequalities in the food system and WASH sector. Below we outline a few examples.

Unlocking the potential: With only 6-7% of current agricultural land in SSA under irrigation there is a potential of 27 to 64 million ha irrigation expansion depending on crop types, using available replenishable groundwater resources. A potential expansion in SSA of 24 million ha under motorized pumping. The latter benefitting 185 million people with net revenues up to 22 billion USD per year. Increasing the number of

small reservoirs would meet nearly 400 million people generating net revenues of USD 20 billion. Dry-season smallholder irrigation in SSA could improve rice yields by 70% to 300%. In the Niger basin irrigation potential is estimated at 1% to 5 % of the total crop area (approx. 0.55-0.9 M ha). Recent research shows that the financial attractiveness of solar powered irrigation over diesel will be dependent on crop choice, diesel fuel price, solar PV. For example for maize, under a future diesel fuel price of 2% and solar PV installed cost of USD 2 per kWp, solar irrigation is a more cost-effective option than diesel irrigation on more than 85% of cropland in southern Africa, 65% of cropland in central African and about 40% and 30% cropland in west and east Africa, respectively. The solar pump outlook 2019 estimated the small solar pump market (<1 kW) by 2030 could potentially reach up to 2.8 million household at a value of 1.6 billion USD. For small solar water pumps irrigation of high-value vegetables can achieve a payback period of around two years.

Unlocking storage and smarter use: For example, a recent global study highlight that in areas with high suitability (i.e. biophysical suitability) enhancing groundwater storage (UTFI *Underground transfer of floods for irrigation*) could account for a population of 3.8 billion people and a crop area of 622 million hectares. Aggregation of the country-specific available data reveals that, currently, 380 billion m^3 of wastewater are produced annually across the world. In terms of use as a source of irrigation in agriculture, this volume of water (without further dilution) could be used to irrigate a maximum 31 million ha, considering no municipal water is discharged into oceans and no losses occur through evaporation, leakages or infiltration into the soil during storage or transportation, agricultural area is available and suitable for irrigation, two crops are grown per year and the cumulative water requirement of both crops is around 12,000 m^3 per ha.

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

Farmer-led irrigation has been incorporated into several agenda's recently:

- African Union Commission (AU) has identified FLI (pillar 2) and unconventional water use (pillar 4) as two out of the 4 pillars in the Framework for Irrigation Development and Agricultural Water Management (IDAWM). AU is currently supporting Member state's internalization
- The World Bank Group (including the International Finance Cooperation have taken up farmer led irrigation in their investment programs in Rwanda, Uganda, Nigeria, Sahel
- Bi-laterial donor support: USAID Feed the Future Innovation Lab on Small Scale Irrigation, Kingdom of the Netherlands Smart Water for Agriculture, Bill and Melinda Gates, Swiss Development, Global Affairs Canada Cooperation, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, African Development Cooperation
- (I)NGO: Mercy Corps (Agrifin), Practica, Overseas Development Institute (ODI), Wetlands International, Caritas
- Private sector investments especially in the field of solar based irrigation, end-user financing modalities and climate smart advisory services have been gaining momentum. This also includes City water and Sanitation Utility Companies
- Global, regional and national multi-stakeholder platforms/dialogues (MSD): Studying African Farmer-led Irrigation, MSD Ghana, MSD Ethiopia, 2030 Water Resources Group, The Global Framework on Water Scarcity in Agriculture (WASAG), Rural Water Supply Network (RWSN), Global Water Partnership (GWP)
- Research community: International Water Management Institute, International Food Policy and Research Institute, Texas AM, Wageningen, University of Manchester, University of Leeds, Daugherty Water for Food Institute at University of Nebraska, Group For Research and Technology Exchanges (GRET)
- International Community on water recycling and re-use: UNU-INWEH, WHO, FAO, UNEP.

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 extent to which farmer-led irrigation scales depends on the availability and reliability of natural resources, energy, the socio-economic environment, labor, input and output markets. FLI is well suited to areas where large scale and infrastructure based projects have relatively high cost and low return on investment. The combination of FLI with water (re) use, is especially highly suited to urban and peri-urban areas where there is opportunity for water re-use and high proximity to market. This will help build resilient cities including adaptation to changing climate, through productive and sustainable use of water bodies and unused urban lands; flood protection; maintenance and increase in biodiversity; retention of prime land through intensification close to markets; urban greening; and protection against heat island effects. But most significantly, it presents the opportunity for improved urban management in combination with developing sustainable agriculture in Africa because of their capacity for recycling water and nutrients.

FLI is less suited in extreme fragile areas with poorly functioning markets as the incentives for investment by farmers and other actors will be too risky for smallholder farmers to invest; development partner support is useful to reduce risks to farmers and input suppliers in these contexts.

What do you think are the key actions required to address this solution?

To unlock the potential would require actors, sectors and investments in FLI, WASH and waste re-use to come together and strengthen policies, investments and markets to address inequalities, accelerate storage, inclusive access, (re) use of water whilst addressing sustainability issues of water and energy in our food system.

Developing policy and legal frameworks to:

- Stimulate cross-sectoral public investment in WASH, FLI and Circular Economy
- Align sectoral policies related to water, agriculture, WASH, energy, climate, gender, and social inclusion where relevant
- Incentivize low carbon and water use (e.g. tax/importation, water, or carbon credits) whilst stimulating water access for the most vulnerable in food systems

Investments and economic leverage:

- *Bundling of best-fit technologies and services which support multiple SDGs* along the storage- access-(re)use continuum requires a systemic, gender and social inclusive approach to ensure its contextual relevance to meet water, climate, agriculture, WASH
- *Aligning and coordinating* of public, private, research, and development actors *across the sectors* to come and move together along the scaling continuum, fostering interactive learning, break down sectoral investments and approaches and building institutional capacity to facilitate systemic change

Fill knowledge gaps through research and pilots

- *Strengthening financing ecosystems for win-win solutions:* This requires the irrigation, agriculture, climate, WASH sector to assess gaps and perverse incentives in the current financing environment both for upstream (private sector investment) and end-user financing. It requires tailored financing to facilitate investments which benefits multiple sectors. An opportunity here is understanding gender gaps in access to, management of and benefits from financing modalities.

Fill data gaps to enhance inclusive governance and monitoring of investment and use: Strengthen data gaps related to public and private sector investment in water solutions, use and management. These can include block chain technologies, 4IR, remote sensing, water accounting. Stimulate open-source data platforms where actors, users and stakeholders can share water information to enhance governance and decision making, reporting on the SDGs, GAP certification and other national and internationally relevant standards across relevant sectors.

SOLUTION 5.21: LONG-TERM CONSERVATION OF FOOD DIVERSITY IN GENE BANKS AND IN THE FIELD, AND SUSTAINED DIVERSIFICATION OF THE FOOD BASKET.

What problem is the solution trying to address?

Food biodiversity, also called agricultural biodiversity or agrobiodiversity, refers to the great variety of domesticated plant and animal species that provide humanity with sustenance, cultural connection, and enjoyment through eating. Food biodiversity also applies to the many thousands of different forms, varieties, and breeds of these crop and livestock species. These plants and animals, together with the associated knowledge, are the foundation of nutrition and livelihoods for families and communities around the world. In addition the crops and livestock domesticated and breed over centuries – and in that have changed from their wild ancestries - have become a cornerstone to our modern agricultural system.

Climate extremes that have increased in frequency and intensity due to climate change such as heat, drought, and flooding. Climate change is among the major drivers of biodiversity loss.
Climate change is having far-reaching impacts on agriculture and food systems across the globe affecting food security (IPCC 2019: p.9) through different means e.g. crop productivity. Productivity of the top ten crops (barely, cassava, maize, oil palm, rapeseed, rice, sorghum, soybean, sugarcane and wheat) is already disturbed (Ray et al. 2019: pp.8-10). Yet, modern agriculture dependent on high-input mostly monocultures is a major contributor to climate change with 27% of GHG emissions coming from the sector. Livestock production by itself produces 14.5% of global GHGs. One third of land surface and 75% of freshwater use is for crop and livestock production. Concurrently, agriculture, is a major driver of biodiversity loss. Agricultural activities have the largest impact on ecosystems that people depend on for food, clean water and a stable climate (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). These climate and biodiversity-loss induced effects lead to socio-economic insecurities and health challenges. The reliance on a narrow food basket of crops and animals further aggravates the situation (for example out of approximately 30,000 documented palatable plant species humanity depends mainly on only 12 crops for the majority of its nutritional needs. This condition has crucial consequences with the accelerated loss of biodiversity as several underutilized plants could be at risk as other foremost crops because of climate change).
The global heritage of food biodiversity is at risk as agricultural production and markets have become more uniform, leading to an erosion of diversity from field to fork. 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. While genebanks and similar initiatives have largely succeeded in developing the technologies needed to adequately safeguard food biodiversity, insufficient or inconsistent funding, poor infrastructure investment, and natural disasters too often threaten this diversity even within these repositories. Moreover, conservation of food biodiversity in such repositories is not practical for all crop and livestock species and their wild relatives, and such ex situ conservation has limited potential to facilitate the continued evolution of these organisms and their associated cultural knowledge in their natural and agricultural habitats. The complementary conservation of these species on farms and in wild spaces is therefore essential to the husbandry and engendering of food biodiversity.

Going forward we need to diversify our food basket and to manage inputs such as water and fertilizers in a systemwide level to balance cost with potential production increases and associated negative impacts on soils. The current trajectory of managing agroecosystems in isolation from their surrounding natural environment, focusing on individual crops or a narrow basket of protein sources, and not preserving our current available biodiversity is a risk not only our resilience, but to our survival.

What, in brief, is the solution?

The overall strategy is to tackle these interrelated challenges as part of a connected system rather than as individual challenges. This "systems" approach should include:

- Investments in new crops *[e.g. orphan crops]*, new plant varieties and new food sources *[e.g. insects, algae, seaweed]* that provide reliable nutritious sources of food that are less polluting and require fewer inputs in the face of climate change.

- Investment in mainstreaming these new food sources within the food basket

- creating incentive schemes to engage a wider audience in the endeavour to safeguard agrobiodiversity and to ensure the sustained diversification of our food systems. This potential engagement ranges from financial support to outreach and communication activities.

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

Papers above include the source of the recommendations

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

Diversification of the food basket has the potential for impact at scale, it is actionable if investments where provided, and is the sustainable way to ensure that we can feed the growing population.

Furthermore, it has positive effects on ensuring equitable livelihood opportunities, advancing human health, and regenerating environmental integrity, with focus on youth, women, marginalized and disabled populations

It is a departure from the existing focus on a few staple crops and animals and ensures a more sustainable production that is resilient to shocks. The solution is disruptive, because it can significantly change the way we define and produce food and the way we address the conservation of our food diversity. It therefore leave a lasting impact in the way our food systems operate in the future.

The solutions is an ambitious undertaking that will require concrete efforts on many fronts.

SOLUTION 5.22 COMMUNITY-BASED DECISION-MAKING MECHANISMS AND INFORMATION SYSTEMS ON LAND RIGHTS AND ACCESS AND CONTROL OVER ESSENTIAL FOOD-PRODUCING RESOURCES TO PROMOTE FOOD SOVEREIGNTY, EQUITABLE LAND AND RESOURCE RIGHTS, EFFECTIVE AND RESPONSIBLE GOVERNANCE, AND SUSTAINABLE LIVELIHOODS.

What problem is the solution trying to address?

The initiative is trying to contribute solutions to hunger and poverty caused by inequitable distribution and control over resources, vulnerability of smallholder farmers to climate change and natural disasters, lack of participation in decision-making and governance, and low returns to the livelihood of smallholder farmers.

Specifically, the initiative will focus on contributing solutions to addressing the vulnerability of the communities to the effects of climate change and economic shocks brought by the pandemic - as the landless and people who do not have access to land and resource rights are amongst the most affected sectors by these anthropological phenomena. The COVID-19 pandemic with its travel restrictions, limited physical contact and prohibition of mass gatherings, has disrupted the food system resulting in inadequate food supply to consumers and surplus products by the producers.

With the lack of land ownership and resource rights experienced by the majority of the smallholders, they are often faced with landgrabbing and unfair contracts by businesses - resulting in land conflicts.

Further, with the prevailing food systems favored by the majority of the population, smallholder farmers are usually left with little to no support (in terms of inputs, infrastructure, marketing, and recognition) from the local governments.

Gender inequality in the farming sector has also been a prevalent concern. With women often less recognized as producers, their access to resources and credit is less.

Lastly, during this pandemic, civil society has witnessed national governments enacting laws and programs in response to the pandemic without or with limited consultations with CSOs and communities. The solutions and health/safety protocols enacted are regarded as blanket national solutions, ignoring differences in local contexts and situations.

What, in brief, is the solution?

Seen as a crucial step towards better planning that is suited to the needs of the smallholders, the initiative will conduct a comprehensive situational profiling of selected farming communities focused on land tenure security, resource management, community participation, gender equity, health and food security, socioeconomic status. In particular:

- Land tenure and access to food
- Purchasing power
- Health and quality of food
- Community participation
- Sustainability of agricultural practices
- Views and practices related to gender and women's rights
- Involvement of the youth
- Effects of climate change, plus ways related to mitigation and adaptation
- Peace and presence/absence of land conflicts
- Short, medium, and long-term effects of COVID

(The list of thematic areas will be finalized during the updating of the framework)

The information from the comprehensive profiles will be used as inputs/bases for the preparation of village-level development plans of partner-communities. Resource mobilization, including the lobbying for the integration of community plans into local government development plans, to support the identified programs, projects, and activities in the said community plans will be undertaken.

In addition, the data will be utilized for studying the establishment of food hubs in the communities that will make local food systems more resilient to shocks - by reducing food kilometers. Shortening the food distance means connecting the producers and the consumers through an integrated food value chain. With established linkages, the food supply chain becomes more efficient as production is anchored on consumers' demand, delivery of products targeted, and wastage minimized. By emphasizing shorter supply chains and local territorial markets, food hubs will also stimulate localized development and employment, while reducing carbon emissions that are usually associated with transporting food, goods and people over wide distances.

At the local, national and regional levels, the data from the profiles will also be used for policy works on the protection of land and resource rights, gender equity, building resiliency and ensuring food security

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

The identified solutions are sourced from the ANGOC Statement on Protecting land Rights and Ensuring Food Security in the Time of COVID-19 - a result of the collaboration of 12 NGOs across eight Asian countries (who are Members of the ANGOC Network) calling for immediate actions from the global community, national governments, and civil society in resolving the systemic inequities that render people susceptible to the effects of the global pandemic. The Statement calls for, among others, the restructuring of the food systems, asserting that secure land rights for all will be integral to achieving food security in a post-COVID-19 world.

The ideas/solutions identified also came from the sharing of the ANGOC Members during the celebration of the World Food Day in 2020 where various interventions implemented were shared as well as the proposed solutions for short- and medium-term issues.

The identified solutions are also based on a village-level initiative in 1998 called the *200 Village Project,* implemented in nine (Bangladesh, India, Indonesia, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam, Cambodia) Asian countries wherein the food security of smallholder farmers were assessed in the household level. Results of the initiative became instrumental for CSOs' evidence-based advocacies relating to food and land tenure security.

The solutions were also derived as a result of analyses from other ANGOC studies including: (a) 2018 State of Land Rights and Land Governance in 8 Asian Countries, (b) 2018 Land Conflict Monitoring in 6 Asian Countries, (c) 2017 Continuum of Land Rights and Food Security in Cambodia, Nepal, and Philippines, (d) 2018 Philippines study on tenure and climate change, among others.

Having a baseline information (particularly on land conflict records and cases in 6 Asian countries) from ANGOC and Partners' ongoing works have shown its positive uses and relevance in the advocacy work. Through these data, governments have been engaged, and not only the land conflict situation became more visible but the CSOs have been recognized for such initiative - accrediting CSO data thus increasing its credibility.

In 2018, a first attempt to link the relationship of land tenure and climate change was conducted for a Philippine study. At present, with the expansion of this particular initiative to five more Asian countries, the recognition of climate change as a factor of food insecurity is becoming even more evident. Further, the role of climate change in food security has also been amplified as we see and recognize that the current pandemic (caused by a zoonotic disease) is a result, among other factors, of climate change.

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

This initiative meets the key criteria outlined in this document.

1. The impact will be broad and wide-reaching in scale, since it will involve multiple small villages in 8 countries (Bangladesh, Cambodia, China, India, Indonesia, Nepal, Philippines, Sri Lanka). The information to be gathered will then snowball into the creation of community plans.
2. The initiative is also actionable, since there is foreseen support from both CSOs, villages, and even the government. Local and national governments will benefit from the data generated and analyzed that will be useful in informing their policies and programs, especially because these wide-scale rural community information-gathering initiatives are rarely conducted by governments. The ANGOC network also has enough experience with implementing a similar initiative in 1998. Plus, since most ANGOC members are national networks themselves, it will be able to access a wide outreach of local CSOs and community organizations in the 8 countries.
3. The initiative will be sustainable since the information-gathering will be used to craft community plans that will outline how the issues faced by communities will be addressed through programs that they themselves may implement. The information will be instrumental in planning and execution of local food hubs that will ensure food security at the village level. Moreover, the ground-level information will be used by communities and CSOs to inform further actions and campaigns.

The initiative also addresses the other criteria:

1. It has foreseen positive effects on ensuring equitable livelihood opportunities, advancing human health, and regenerating environmental integrity, with focus on youth, women, marginalized populations.
2. It is a large departure from the usual practice of the top-down approach in policy making and planning, and addresses the lack of importance provided to information from the ground.
3. The impacts are foreseen to persist to the medium- and long-term given that community plans, campaign strategies, and policies will be crafted from the information to be made available.
4. Gender equality and women's empowerment in food consumption and production systems will also be included in the framework.

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

From the presentations of the results of various efforts on land and land data monitoring and household-level food security assessment (including the 200 Village Project), there has been recognition by the government that available data is not sufficient to assess local needs.

During an engagement initiative of ANGOC and CSO partners with the National Statistics Offices (NSOs) in eight Asian countries in 2018-19, the NSOs have expressed their openness to collaborate with CSOs on improving available data on land, in particular on Sustainable Development Goal indicator 1.4.2 (on tenure security).

In an ongoing implementation of the *Secure Access to Land and Resources (SALaR)* of the UN Habitat's Global Land Tool Network with the Xavier Science Foundation, Inc. and ANGOC in Northern Mindanao, Philippines, the data from the land tenure inventory of the Project are being recognized by their local government units regarding the house and farm lots of the partner indigenous people.

For this particular initiative, since similar actions have been previously done during the 200 Village Project in 1998, the ANGOC Network will be able to revive and update the framework suited to the present situation.

Through its track record of conducting research and evidence-based policy work, the ANGOC network has established its credibility and reliability among governments in Asia. Some leaders from the ANGOC network are recognized as key resource persons and technical working group members of formal government mechanisms in their respective home countries.

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 current framework that will be updated has been applied only to rural communities in Asia. The ANGOC network has not yet tested its application outside of Asia or its application to the urban context

What do you think are the key actions required to address this solution?

Public policies

- At the public policy level, memoranda of understanding (MOUs) or partnership agreements between implementing CSOs and local government units (LGUs) are needed to ensure cooperation and the smooth implementation of the initiative, given that the government will also benefit from the data to be collected. Data to be generated will be analyzed, consolidated, and used for policy work on food and tenure security, health and nutrition, climate change, agricultural technologies, etc.
- The implementation of this initiative will also be dependent on the health protocols in place due to the pandemic. The workplan would have to be adjusted based on the restrictions that will be in place in the 8 countries.
- Following-up on the actions that will come out from this intervention will also need LGU/government support.

- **Civil society actions**
  - The success of the intervention will depend on the willingness and commitment of local CSOs to be part of the process, and their understanding of the framework.

THEORY OF CHANGE

The table presents the activities, outputs, short-term outcomes, and long-term outcomes of the identified components towards contributing solutions to hunger and poverty caused by inequitable distribution and control over resources, low returns to the livelihood of smallholder farmers, and lack of smallholders' participation in decision making. The main components include the (i) Comprehensive profiling of rural households, (ii) Inputs to village-level development plans, (iii) Establishment of local food hubs, and (iv) Local-national-regional level policy work.

	Comprehensive profiling of rural households	Inputs to village-level development plans	Establishment of local food hubs	Local, National and Regional-level policy work
Activities	Participatory assessment/planning involving the CSOs and communities in 8 countries, with ample participation of women and youth Updating of the 1998 200-Village Project framework Creation of questionnaires/ data gathering tools, enumerators' manual, and database Hiring and training of local enumerators Conduct of data-gathering Analysis of findings, recommendations, production of national reports Conduct of local multi-stakeholder dialogues to	Community meetings to discuss findings from data-gathering in preparation for the updating or creation of their community plans Community's participation in the village-level development planning to input their agenda based on the community plans they prepared Capacity building interventions on planning, negotiation, disaster preparedness, etc. National workshops on good practices and sharing/ exchange among CSOs and local communities Regional workshop on tooling of approaches used	Conduct of feasibility studies on establishing local food hubs based on the information gathered in the comprehensive household profiling Engaging local governments and other stakeholders (i.e., producers and consumer groups)	Presentation of results and dialogue (using the data from the comprehensive profiles, and experiences from the engagement with the local government units and establishment of food hubs) with the relevant government agencies

	discuss findings and recommendations National multi-stakeholder dialogues to discuss findings and recommendations Regional workshop and sharing of experiences/findings	for planning, participatory enumeration, etc.		
Outputs	Comprehensive profiles of rural households focused on the thematic areas above Analysis of the short- and medium-term impacts of COVID-19 on communities Communities' increased awareness of the analysis of risk and vulnerability of communities to climate change	Village-level (local government unit) plans mainstreaming the proposed projects of the communities on improving their tenure rights and smallholder farming Concept proposals based on needs and resource analysis identified in the community plans prepared by communities with the support of local CSOs Training courses implemented on increasing the resilience of communities to climate change	Assessment of the feasibility of establishing local food hubs, including the identification of appropriate areas for food hub establishment	Policy briefs on tenure, food security, and its relations with gender, governance, youth, climate change Governments expressing support to the advocacy on tenure rights protection, and promotion of smallholder agriculture and establishment of local food hubs Policy proposals to address the short- and medium-term impacts of COVID-19 on communities Policy proposals to mitigate the impacts of climate change on tenure, and food security and nutrition
Short Term Outcomes	Information available to inform local community planning, CSO policy work, and government programs. Information available for comparison of national and regional rural communities across several indicators/ thematic areas.	Implemented projects suited to the needs and resources of the smallholders Support (e.g. inputs, infrastructure, marketing) provided to the smallholders by the local government unit (village level)	Shortened distance between producers and consumers through the establishment of local food hubs	Mainstreaming of the advocacy (tenure, food security, and its relations with gender, youth, climate change, and COVID-19) in the local, national, and regional agenda Formed links between and among communities from the 8 countries, for solidarity and sharing lessons from initiatives Enhanced capacities of communities in defending their land and resource rights, enhancing food security, adapting to and mitigating the effects of climate change, improving resilience to pandemics
Long Term Outcomes /Impacts	Baseline that may be used by communities, CSOs, and government for program/ policy monitoring and evaluation	Strong, stable, local food supply chains that have fair prices, that ensure food security among communities, and are resilient to external pressures such as climate change and economic shocks		Effective and gender-responsive policies and programs on securing land rights, ensuring food security, building resiliency of local communities to climate change and pandemics, enacted and implemented at local, national, and regional levels

· *If there are any major assumptions that must hold for the theory of change to be valid, these should be stated. Similarly, if there are any key risks or potential unintended consequences of enacting this solution if those assumptions do not hold, those should also be mentioned.*

One major assumption for this initiative is that its implementation will have the support of and will be done in partnership with local governments. This will provide the initiative with a sense of legitimacy and will also allow LGUs to see how this pursuit may contribute to local government planning.

The ongoing pandemic however, makes the mode of implementation uncertain. It is not yet clear whether regulations and restrictions will be lifted by the time this initiative is being rolled out. These restrictions may impose limitations on the workplan.

Another identified risk is the uncertain peace and order situation in local communities. Given that many rural communities are involved in land and resource conflicts, or are caught between armed conflicts. These security situations would have to be assessed before the implementation of the project, to prevent any negative consequences to the communities, the CSOs, and/or the enumerators.

Communities' expectations should also be managed, as there is no certainty that the activities and programs outlined in their plans would be funded and launched as actual projects.

SOLUTION 5.23: THE GLOBAL NETWORK AGAINST FOOD CRISES, AN INNOVATIVE APPROACH TO ADDRESS COMPLEX FOOD CRISES WITH INTEGRATIVE APPROACHES

(HDP nexus, Joint Area-based Interventions), shared information and driving causes

What problem is the solution trying to address?

Evidence shows that millions of people are increasingly exposed to food crises. According to the Global Report on Food Crises (GRFC), the number of people facing acute food insecurity between 2016 and 2019 consistently exceeded 100 million – with 135 million people in 2019; the figures for 2020, are expected to be close to 170 M. The great majority of food insecure people live in areas characterised by fragility in a broad sense (eco-systems, climate shocks, conflict and violence, weak institutions, weak taxation systems and limited national budgets, democratic deficits). Long-term displacement, political instability and conflicts, together with climate-related disasters, economic shocks and pests/diseases/pandemics are main drivers of all major food crises. Those compounded risks act simultaneously or sequentially, reinforcing each other in any case, creating a vicious circle that needs to be broken with a multi-dimensional approach.

As of today, 44 out of 55 food crises (82 percent) are occurring in countries that are included in the 2020 OECD states of fragility list. Seven out of the ten worst food crises are in states defined as "extremely fragile". Consequently, sustainable food systems in fragile contexts have been identified as a critical area of intervention to promote long-term food security and to contribute to peace and societal well-being. In such contexts, building resilient local food systems is key to alleviating humanitarian suffering, fostering development, preventing the outbreak or escalation of conflict, and promoting peace.

Challenges and relevant difficulties food systems have to confront in fragile states: (a) Significant territory with no State presence, and thus where Food Security public policies are implemented, (b) poor infrastructure (roads, communication, public health posts), (c) cross-boundary conflicts over resources (land, water, minerals, forests), (d) weak institutional architecture, (e) operational food/non-food agricultural chains despite state absence (no regulatory or taxation systems), (f) poor enforcement of proprietary schemes and trading power, (g) power imbalances or inequitable food systems (oligopolies, few commodity-exporting companies, land grabbing), (h) many fragile states are overwhelmingly rural, with a high proportion earning a living out of temporary labour, (i) occurrences of long-term displaced populations, (j) economic instability and international sanctions in some cases. Those features have been put under additional stress in 2020 with the COVID-19 global health crisis and the locust plague in Africa and Middle East.

Compounded risks to food systems also compromise adequate production and transport, food access (both physical and economic), dietary diversity, food safety for a significant proportion of the population.
Therefore, humanitarian, developmental or peacebuilding solutions to those multi-factored crises cannot achieve success working in isolation or when implemented in a strictly linear approach. There needs to be greater effort to layer and sequence linkages between humanitarian, development and peace programming to ensure that immediate humanitarian needs are met, while addressing the longer-term drivers of crises through development and peace approaches. This 'nexus approach' needs be based on a shared understanding of risks and vulnerabilities and anchored in the respective comparative advantage of humanitarian development and peace actors to reduce needs over time before, during and after crises

What, in brief, is the solution?

As the drivers of complex and protracted food crises are diverse (acting simultaneously or reinforcing each other), the Global Network Against Food Crises (GNAFC) is an innovative mechanism to tackle the root causes of food crises and promote sustainable and long-lasting solutions through (a) shared analysis and knowledge, (b) strengthened coordination in evidence-based joint responses and collective efforts across the HDP nexus, both at policy and field level.

The GNAFC offers a framework, still to be fully developed, to support existing coordination and partnerships within existing architecture and to improve joint advocacy, decision-making, policy and joint programming. Achieving these objectives involves a systematic '3x3 approach', working at the global, regional and national levels along three interlinked

dimensions: 1. Understanding of food crises through consensus-based analyses and coherent monitoring systems; 2. Leveraging investments in food security and nutrition by undertaking joint planning, programming and M&E, improving coherence across humanitarian, development and peace actions; and 3. 'Going beyond food' by enhancing coordination with actors to address the overall political, economic, societal, environmental and security drivers of food insecurity thereby contributing to sustainable food systems and reduced hunger.

At country level, the GNAFC contributes to two of the AT5 specific objectives to "Build resilience", namely (1) ensuring the functionality of food systems in areas vulnerable to conflict or disasters as the GNAFC focuses on food crises in fragile settings, and (2) promoting global action to protect food supplies from the impacts of pandemics (by working at regional and global level).

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

The GNAFC was launched by the European Commission, FAO and WFP at the 2016 World Humanitarian Summit. Since then, other resource partners and UN agencies have engaged in the Senior Steering Group that now also includes USA, UK, Canada, Netherlands, the Global Food Security and Nutrition Clusters.

In the framework of the Food Systems Summit, the European Commission has also submitted the proposal on the GNAFC as a game-changing idea, and USAID has endorsed this proposal in the Food System Summit working groups.

How can this solution address that problem?

The theory of change departs from the complex multi-causality of food crises, with several stressors and risks affecting simultaneously and sequentially the livelihoods of vulnerable households.

Poor nutrition, knowledge, access to assets, empowerment and human rights affect individual and household resilience. Thus, any solution should be multi-pronged from the beginning, including simultaneous, sequencing and layering of HDP interventions . That approach should be implemented at national level generating collective outcomes between the UN system, bilateral donors, host government and implementing CSOs; and at field level leveraging joint area-based interventions. A consensus around drivers, key leverage points and priority interventions is necessary to agree on joint goals, actions and pooled resources. .

Only joint assessments will lead to joint or joined-up interventions. To this end:

1) The GNAFC convenes stakeholders from the humanitarian, development and peace-building realms to synthesize evidence on the underlying drivers of food crises in fragile settings, including the environmental, political, economic, societal and security risks that impact upon resilience of individuals, households and communities. The GNAFC supports the development of consensus-based tools and guidelines to shape investments around the transformation and resilience of food systems in fragile contexts. Specific tools include the Global Report on Food Crises, which provides global figures of acute food insecurity; the REDDI indicators "Resilience Evidence for Decision in Development Initiative "; and FAO-WFP Early Warning Analysis of Acute Food Insecurity Hotspots.

2) The GNAFC can also support countries with food crises by a) leveraging investments in food security and nutrition, and b) by promoting joint planning, programming and M&E amongst HDP actors, both at national as well as field (area-based) level. The upcoming Global Network's analysis on "Financial flows and food crises" will provide overview of the international humanitarian assistance and official development assistance to food sectors in the 54 countries identified by the Global Report on Food Crisis with the aim to inform priority areas for investment in food crises. 3) Finally, in order to create resilient food systems in fragile settings , we need to go 'beyond food' solutions by improving resilience at different levels, addressing compounded drivers of food crises and reinforcing key elements that maintain food systems functional, protect food chains and enable the most vulnerable to steer their own development pathways. To this end, the GNAFC can support a) the design of investments to build resilient food systems in fragile contexts; b) identification of anticipatory actions; d) the monitoring and assessments on conflict and food security (such as support reporting against the UNSCR 2417 on Famine and Conflict), climate extremes, gender-balanced food security statistics and social cohesion.

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

There are active and valuable coordination platforms within the humanitarian and developments communities, both within the UN system and the bilateral donors and financing institutions. Those platforms are also mirrored within the NGOs and CSO community. On the other side, peace building/peace making initiatives have been mostly addressed by diplomatic means and through the UN peacekeeping missions.

The GNAFC posits a paradigm change and a different operational mechanism to understand and address complex food crises. Promoting a common understanding of food crises, collective outcomes, joint programmes and M&E schemes, plus generating knowledge on drivers and pathways to resilient food systems, are innovative ways to address food insecurity and build resilience in food crises.

All in all, the Global Network's systemic, multi-level, multi-dimensional and multi-stakeholder approach based on shared principles, expertise and institutional mandates, and articulated through a concrete roadmap constitutes a powerful change of paradigm in the triple nexus approach to food resilience.

The systems approach of the GNAFC, along with the emphasis on supporting and strengthening nexus approaches can be scaled up if and when prove successful. Those approaches, requiring many actors to be aligned, take longer than usual to plan, appraise, budget and implement, but they consolidate trust, mutual accountability and long-term institutional suitability. Moreover, co-benefits are self-evident for humanitarian and developmental actors, as well as for non-food related domains of intervention. By combining humanitarian needs-based approaches with developmental rights-based approaches, the prospects for peace and social stability can be forged, transforming the vicious circle into a virtuous spiral.

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

In the framework of the Food Systems Summit, the European Commission has also submitted the proposal on the GNAFC as a game-changing idea, and USAID has endorsed this proposal in the Food System Summit working groups. Other countries such as UK, Canada or The Netherlands would be supportive.

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 GNAFC is appropriate as a coordinating mechanism to address complex and protracted food crises. According to the latest Global Report on Food Crises, there are 55 countries currently experiencing food crises (measured by absolute or percentual figures of acute food insecure people).

What do you think are the key actions required to address this solution?

The GNAFC already exists and has financial and political support to operate in those 55 food crises. So far, the European Union is providing financial support to the GBAFC activities.. Based on the rationality unfolded above, it could be good to have a multi-donor pool of funds, operating under flexible and adaptable rules, to support HDP nexus interventions at three levels (the "3*3").

At policy level, the GNAFC 's Senior Steering Group could be enriched and expanded to include International Financial Institutions that have strong interests in food crises and fragile settings, as well as other UN agencies that work across the HDP nexus and have signed off the OECD HDP guidelines.

Along the lines of the inclusive mechanism of the Committee of World Food Security (CFS), the Global Network could incorporate representatives from the private sector and the civil society, as well as from the UN Peace keeping Operations.

SOLUTION 5.24: ESTABLISH A GLOBAL CENTRE FOR RISK ASSESSMENT & POLICY RESPONSE ON CONFLICT AND HUNGER

A global center with dispersed location to establish a common understanding of the pathways and root causes of food insecurity in conflict settings.

What, in brief, is the solution?

A global centre, with a dispersed location in regions marked by hunger and conflict brings together experts, food systems actors and peacebuilding practitioners to establish a common understanding of the pathways and root causes of food insecurity in conflict settings. It also provides recommendations for effective food systems interventions on the basis of this understanding. By promoting a comprehensive approach to food security and peace, the centre brings the response and prevention agendas closer together. Where the Food and Peace Facilities concentrate on strategies and programming, the Global Centre concentrates on policy and instruments. To do this it

- Provides analysis of the relationship between food insecurity and violent conflict to:
    - Identify risk management priorities (for short-to-medium term action)
    - Identify root causes of food insecurity (for medium-to-long term priorities for policy and action);
- Increases global awareness of these relationships, including in regional and multinational organizations, as well as international fora;
- Provides analysis and research on opportunities for interventions that combine enhancing food security, livelihoods and resilient food systems with sustaining peace;
- Provides recommendations on preparedness, planning and appropriate instruments for food security interventions in conflict-affected communities, and with the threefold aim of alleviating immediate need, addressing the root causes of food insecurity and contributing to peace;
- Conducts horizon scanning and develops potential scenarios in countries facing weak food systems and/or violent conflict;
- Strengthens regional and national risk assessment capacities and risk management possibilities;
- Works closely with experts and organizations who explore linkages between food insecurity and violent conflict, such as the Global Network Against Food Crises and its member states:
    - The centre should support the work of the Global Network by expanding the evidence base for the relationship between food insecurity and violent conflict; identifying strategic investments to prepare, prevent and respond to food crises in conflict-affected areas; and building political consensus on the pathways and root causes of food insecurity in conflict settings;
    - Synergies and areas of collaboration with the Global Network's work should be explored to amalgamate efforts, where appropriate, and avoid duplication;
- Links research and evidence-based interventions with ongoing policy debates and concrete actions, including global discussions on SDG 2 and 16, UNSDCFs, national hunger eradication programs, etc.;
- Supports the broadening and strengthening of a global community of thought and practice on enhancing peace and food security;
- Promotes the implementation of existing frameworks that underscore the relationship between food insecurity and violent conflict, including the Committee on World Food Security's (CFS) Framework for Action for Food Security and Nutrition in Protracted Crises.

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

The solution emerged from a member of the working group and was developed following discussion with the group. It draws on the experience of working group members, who see the lack of global consensus on the relationship between food systems and violent conflict in their respective policy areas. The solution also draws from suggested solutions submitted in a survey of AT5 members.

What problem is it trying to address within food systems?
Despite ample evidence that violent conflict gravely weakens food systems and is the leading driver of food insecurity, a common understanding of the pathways and root causes of food insecurity in conflict settings does not exist. As a result, there is also a lack of coherent, comprehensive and systematic policy recommendations for effective food systems interventions in conflict settings.

How can this solution address that problem?
Theory of Change: **If** the policy community has a common understanding of the root causes and causal pathways of food insecurity in conflict settings, and of risk management priorities in areas facing violent conflict, **then** international organizations, actors in conflict-affected countries and donor governments can act more effectively to prevent deterioration of food systems in conflict settings, creating stronger food systems and enhancing the prospects of peace.

Inputs:

- An active network of states, academics and think tanks, together with humanitarian, development and peacebuilding actors from around the world;
- Analysis of the relationship between food insecurity and violent conflict;
- Recommendations on food security interventions that address the root causes and causal pathways of hunger in conflict-affected communities;
- Recommendations on interventions that contribute to sustaining peace by addressing underlying drivers of conflict;
- Horizon scanning and potential scenarios to help define policy priorities;
- Support for regional and national risk assessment capacities and risk management possibilities.

Outputs:

- Risk management priorities, for short-to-medium term action, are identified;
- Response and prevention priorities are identified;
- Research and evidence-based interventions are linked with ongoing policy debates and concrete actions including global discussions on SDG 2 and 16, UNSDCFs, national hunger eradication programs, etc.

Outcome:

- Global consensus on the root causes of food insecurity in conflict settings, allowing for medium-to-long term priorities for policy and action;
- Increased global awareness of the relationship between strong, sustainable food systems and positive peace;
- More impactful and sustainable peacebuilding, food security, livelihoods, climate resilience, and early warning interventions;
- Improved understanding of the impact of peacebuilding interventions on food systems, and of food system interventions on the prospects of peace.

Impact:

- Stronger, more sustainable food systems;
- Positive peace in previously conflict-affected areas.

Assumptions:

- States, academics, applied science, humanitarian, development and peacebuilding actors will work together effectively;
- The global center will have sustainable, long-term funding.

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

By establishing a common understanding of the pathways and root causes of food insecurity in conflict settings – and by providing policy recommendations on the basis this understanding – the global centre will fundamentally shift food system interventions in conflict-affected areas. Given its focus on horizon scanning and prevention, it will also ensure a large return on investment, especially through reducing the global humanitarian burden. With adequate funding, the global centre is a sustainable solution focused on medium to long term impact. Lastly, by building global consensus on the relationship between food insecurity and violent conflict, the centre will also help to eliminate the economic and political self-interest of actors from food systems interventions, ultimately making its policy recommendations more easily actionable.

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 solution builds on the demonstrated returns on investment of food security related early warning and anticipatory action activities that contribute to the prospects of peace. One example is FAO's anticipatory actions in the La Guajira region of Colombia, which helped to improve social cohesion between host and migrant households targeted by the project.

The solution also draws upon examples of risk assessment informing innovative food security instruments including risk financing, such as the Africa Risk Capacity, and index insurance for small-holder farmers.

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

Many countries are likely to support this idea. These include:

- **The Netherlands, Côte d'Ivoire, Kuwait,** and **Sweden** – penholders of UNSCR 2417 which highlighted the relationship between war and hunger.
- **Denmark**, who funds WFP's knowledge partnership with SIPRI focused on improving the evidence base for the relationship between food and security.
- **Saint Vincent and the Grenadines**, who, during its November 2020 Presidency of the UN Security Council, held a virtual open debate on "Peacebuilding and sustaining peace: contemporary drivers of conflict and insecurity.
- **Member states of the Committee on World Food Security (CFS),** which endorsed, in 2015, the Framework for Action on Food Security and Nutrition in Protracted Crises.
- **Member states of the Global Network Against Food Crises,** whose objective is to "improve coordination and integration of actions along the Humanitarian-Development-Peace nexus for long lasting solutions to food crises".
- **Member states of the Intergovernmental Authority on Development (IGAD)**, whose *2020-2022 Food Security and Nutrition Response Strategy* recognizes the adverse impact of conflict-induced shocks on food security.
- **Member states at the System Board and the General Assembly of Centers CGIAR (Consultative Group on International Agricultural Research**)
- UN organizations and NGOs working on issues related to land/water/food security or violent conflict

The **World Bank** may support this solution given its ongoing efforts on the Famine Action Mechanism, the Crisis Response Window- Early Responses to Slower-onset Events (CRW-ERF) and the Early Warning for Early Action hub focused on integrated food security monitoring. Synergies and areas of collaboration with the World Bank's work should be explored to amalgamate efforts, where appropriate, and avoid duplication.

CGIAR (the Consultative Group on International Agricultural Research) has already indicated support, including the willingness of its member organizations to play an active role in this solution.

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 global centre would benefit from a dispersed location across several regions experiencing hunger and conflict. This will ensure that the center's policy recommendations are grounded in the experiences of local actors and data from conflict-affected communities. This will also ensure that the centre is accessible to regional, national, and local policy makers in conflict-affected areas.

What do you think are the key actions required to address this solution? Please mention the implementation approach for 3 levels, if appropriate:

Buy-in is required at two key levels to ensure the establishment and long-term success of Food and Peace Facilities:

a. By actors working across the humanitarian-development-peace nexus: scientific, humanitarian, development and peacebuilding actors must work together effectively to build consensus.

a. By donors: long-term, sustainable funding is required to ensure the success of this solution. Where appropriate, the findings and recommendations of the global centre should inform donor and national government policies in countries affected by conflict.

SOLUTION 5.25 SYSTEMIC APPROACHES TO RISK ANALYSIS

Tools (national risk inventory systems to systematically monitor losses and assess threats), anticipatory mechanisms, shock-responsive safety nets, insurance and micro-borrowing mechanisms.

What, in brief, is the solution?

New and innovative approaches are required to better understand and manage the interconnected threats to food systems. Current risk management and governance mechanisms and approaches are inadequate for dealing with the way in which risk accumulates and is realized across sectors and scales. Systemic risk assessment that transcend sectors can help make sense of how agriculture, markets, nutrition, public health, transportation, etc. are interconnected and can facilitate the propagation of risk in ways that we have not prepared for. Governance of such systemic risks requires shifts in the institutions, technologies, and personnel that manage risk, and changes to ecological, economic and social processes including consumption and resource use patterns. To build resilience in food systems, effective governance of systemic risks must be adaptive and multiscale. It must rely on iterative learning, community acceptance of adaptations, planning, policy-making implementation and evaluation.

Therefore, this solution entails making food systems more resilient through the application of systemic approaches to risk analysis, and accelerated learning methods, that in turn encourage transformations towards more integrated, agile management systems.

Source from which the solution emerged (survey, member states, leadership team, others)?

UNDRR has been engaging with multi-stakeholder initiatives to better understand systemic risk since 2017. The findings of UNDRR's forthcoming GAR Special Report on Drought highlight the important transitions that will be instrumental to managing the risks that threaten both food system resilience and the Sustainable Development Goals, in general. Reducing risk to food systems and building resilience depend on adaptive governance mechanisms built on a foundation of systemic analysis of risk to ensure that the threats to food systems can be better understood and managed.

What problem is the solution trying to address in food systems?

Information used to understand risk in food systems is often sector-specific and short term. Such siloed and disconnected analysis often focuses on a narrow outcome, such as water availability rather than seeking to build a resilient food system. A wider range of risk drivers such as involuntary migration, unplanned urbanization and rising inequality are seldom considered as being integral parts of the wider food system. Single issue and short-term policy fixes hide wider connections. Assessing the threats to food systems requires more systemic and integrated approaches across multiple scales and disciplines that reflect the ways the drivers of risk are interconnected. This solution aims to highlight resilience-building options that pay multiple dividends in protecting food systems as well as supporting the attainment of all SDGs.

How does the solution relate to your Working Group and its goals?

This solution aims to support the cross-cutting efforts of Action Track 5. The objective is to facilitate Member States and their development partners to understand threats to food systems in a holistic way. This solution aims to empower them to better understand root causes to prevent the propagation of risk in food systems, as well as prepare for, withstand, and recover from shocks and stressors.

Theory of Change, assumptions, risks, likelihood of implementation

Impact: Food Systems are made more resilient through the application of systemic approaches to risk analysis, and accelerated learning methods, that in turn encourage transformations towards more integrated, agile management systems.

Outcomes:

- Transitions in social-ecological systems are better managed through collaborative, cross-sectoral approaches that address drivers of risk.
- Flexible, adaptive governance architecture is capable of the coordinated action needed to meet the challenges of sustainably managing the multiple systems required to build resilience.
- Emergence of innovative risk management strategies that are rooted in the complexity, ambiguity and diversity of interconnected systems.

Outputs:

Outputs	
1. Systemic risk information access, analysis, organization	• Supporting Member States to develop national risk inventory systems to systematically monitor losses and assess threats to food systems across sectors • Supporting Member States to ensure national agencies are able to connect information with incentives and support to integrate new approaches to governance of systemic risks.
2. Catalyze new information systems	• Articulating the benefits of proactive risk management including co-benefits for other public goods, and costs of inaction, and creating a compelling narrative/vision for a future that puts resilience first. • Supporting Member State institutions and their partners to integrate systemic approaches to risk assessment in development planning
3. Help and Tools for planning and action	• By facilitating formal, strategic, and systematic coordination across actors (public, private, sectors and levels of governance) beyond *ad hoc* projects • Facilitating inclusive and participatory planning to promote both equity and evidence as a basis for planning • Support the value cases through which Member States can build social protection systems through tools such as conditional cash transfer, temporary employment schemes; micro-insurance and loans; in consideration of the social floor and poverty line. • Upgrade the resilience of wider government financing through results based lending and innovative financial tools such as resilience bonds.
4. Influencing Agenda Setters	• Building on international momentum on climate adaptation and SDG policies to bring attention and resources to the reduction of climate-related risk • Providing evidence for the sound business case of financing systemic risk management approaches and preventative drought management action. • Facilitating shifts in policy responsibility for protecting food system resilience (and similarly for emergent risks such as from climate change) to a unit with political authority and investment authority • Facilitate initiatives to proactively build the resilience of food systems based on inclusive partnerships between government, private sector and civil society • Support Member States to align goals in protecting the resilience of food systems with investment to ensure its viability

How the solution is "GAME CHANGING"

Over the decades, the way we have transformed our planet to meet the consumption needs of an ever-growing population has created new conditions for risks to emerge. This solution is game changing because it provides tools

to help countries keep pace with the rapidly increasing interconnected risks that threaten the resilience of food systems. The approaches underpinning this proposal seek to connect a broad cross-section of stakeholders – recognizing that more perspectives offer a broader portfolio of solutions. It focuses on enhancing the evidence base for decision-making across sectors and siloes, recognizing that only a truly multi-sectoral, multi-stakeholder approach will strengthen the resilience of food systems.

Context for which the solution is best suited (geographic, situational, conflict settings, low income, arid, etc.)

This solution is broadly aligned to processes and actors at the national level, but the implications should be understood to have broader applicability. Many of the principles that inspire this solution and the actions that are proposed could be applied in local government, in organizations or projects. Although the approach has universal relevance, its insights are most pertinent to areas currently at risk to serious food system shocks due to factors such as inequality, conflict, or rapid changes in the hydrological context due to climate change or other factors.

Key actions required

Public Sector: Public sector actors at all levels are critical partners and stakeholders in this approach. Any proposal or intervention arising from the evidence and consultative process described above must first be measured against existing development priorities, strategic policies and realistic economic capacities. In some cases, this may require relatively modest amendments to regulatory codes while in others the shifts required to protect food systems could imply much more fundamental pivoting of existing approaches.

Private Sector: The role of the private sector in growing economies, providing livelihoods and markets and facilitating access must also be balanced with its role in contributing to growing resilience. The expectation of the private sector is that its investments will positively contribute to resilience as opposed to simply avoiding creating what can become burdensome damaged stock. The business case for healthy communities, facilitated trade, safe infrastructure, productive farms and thriving societies will attract private sector partners.

Civil Society: The focus of much of the above solution is on inclusivity, equity and participation. The role of communities in promoting their own expectations for the health of the systems that provide their food cannot be replaced. Their role in contributing to the thriving social, ecological and environmental ecosystem that will ensure sustainable food systems is essential.

5 NEXT STEPS

The identification of game changing solutions continues and AT5 looks forward to the process of aligning and cross-fertilising ideas across the different ATs. Important ideas for solutions emerging from the Food System Summit Dialogues, such as the need to focus on issues related to risk reduction and risk management in relation to Small Islands States (SIS), coastal areas and in fragility contexts.

Action Track 5 is working on game changers to be proposed in the future. These include:

1) **Integrative Nexus approaches to build food systems resilience** such as
   - Humanitarian-Development-Peace Nexus (HDP Nexus) in conflict-torn food systems and food crises in fragile countries;
   - Nexus water, renewable energy and food production;
   - Nexus climate, food, water, biodiversity and health to prevent Pandemics (IPBES/IPCC One Health approach).

2) **Multi- Risk Reduction and Management for example in relation to** resilient investments to withstand the impacts of climate/environmental/economic shocks/conflict /Pandemics:

- **Small island states (SIS) and coastal areas** can reduce vulnerabilities and build resilience through:
  - Preventing extreme climate events/floods: EWS, shock-responsive safety nets, weather-related insurance schemes, forecasted-based financing, Insu-resilience.
  - Joint Planning to safeguarding coastal areas: EWS, nature-based solutions (mangrove/ocean reforestation), enhancing adaptive capacity or infrastructure.
  - Eco-logical local food systems of small producers (including Blue-economy) linked to food procurement programs for Home Grown School Feeding.
- **Deserts and Arid & Semi-Arid Lands:** EWS, Adaptive social protection in the Sahel**,** the Sahel Resilience Programme, the R4 Rural Resilience in East Africa, Nut-sensitive Social Protection.

3) Universal food access to build resilience. Reframing food as a public good, as a *medicine,* as human right to inform policy options, legal provisions, subsidies allocations to guarantee the universal access to food to all. This can be done through universalization of policies (i.e. school feeding, universal basic income linked to food baskets, or minimum salary thresholds above the food basket), the Health Care System, scale up of Employment Generation Schemes linked to adaptation/mitigation work, procurement policies targeting small local organic farmers, food banks as part of safety nets, nutritional education as part of national curricula.

4) **Transition pathways to resilient food systems and the SDGs:** as part of the integrative approaches to complex issues (i.e. multi-risk resilience, protracted crises, compounded vulnerabilities), and grounded on tricentric governance schemes, AT5 proposes the development

of National Food Systems' Resilience Policy and Action Plans 2021- 2030 to establish local, agro-ecological, resilient food systems, aligned with National Adaptation Plans-NAP, National Determined Contributions-NDCs, Disaster Risk Reduction Plans and the FSS-framed Transition Pathways to Resilient Food Systems (TPRFS) in order to meet the SDGs.

ANNEX

Framing Environmental Resilience

A context paper to the AT5 Environment Working Group solutions

1. Humanity is in a Planetary Emergency

Inter-connected crises are unfolding. The climate emergency, the nature crisis, the scale of pollution, the COVID-19 pandemic, and its socio-economic impacts at multiple scales, are all aggravating numerous food crises and pose existential threats to both humans and the ecosystems that support all life on earth.

Small scale farmers, herders, fishers, forest dwellers, food worker and their families are at the heart of food and nutrition security and central to achieving sustainable development. Managing over 80% of the world's estimated 500 million small farms, they provide over 80% of the food consumed in a large part of the developing world (and contributing significantly to poverty reduction and food security). At the same time, smallholders are also the custodians of healthy ecosystems and biodiversity – and paradoxically, they are often among the world's poorest and most food insecure.

The global food system is failing to meet all human needs equitably now and will be insufficient for long-term survival of humanity on the planet - climate, biodiversity and ecosystem services (forests, soils, freshwater, oceans), health (pandemics/zoonotic disease).

2. The food system is brittle and breaking

Many life supporting services are dependent on agri-food systems - and yet these are currently designed to increase productivity with minimal consideration to the interconnectedness between the various system. Food systems are seriously contributing to climate change, land use change, biodiversity loss, over-exploitation of natural resources and pollution of air, water and soils, as well as poor health and poverty, with inequitable access to resources and benefits from food systems.

Some 690 million people suffer from hunger globally (8.9% of the world population) and 3 billion cannot afford a healthy diet. The FAO estimates that the pandemic could add up to 132 million food-insecure people to this number. Food systems are responsible for 21–37% of total anthropogenic GHG emissions. Biodiversity is under severe threat – land use and land use change are the biggest causes, for which agriculture is the primary driver. Globally, species extinction risk has worsened by about 10% over the last three decades. Approximately one third of the land used for food, fibre and feed production is degraded, and agriculture accounts for 70 per cent of freshwater withdrawals worldwide.

This is no longer tenable sustainable and just - nor is it resilient.

In order to drive for the transformation of the food system at scale, we must prevent, anticipate, absorb and adapt to multiple risks and threats. Urgent application of disaster, climate, crisis and conflict risk management measures are needed - across the entire food systems and its different food value chains (from production to consumption). This is the only way to tackle the root causes, and to respond to the emergency needs from these interconnected and unfolding crises.

3. Resilience: There is no vaccine for climate and nature crisis

Climate and other environmental have been identified as the risks most likely to occur in the next decade and with the most severe global impacts across all systems. These further exacerbate inequalities, especially for the agri-food systems. Ecological disruption is the 21st Century's most under-estimated security threat. The risks include climate change, overexploitation of nature and pollution, especially in term of soil, water, forest, biodiversity and

aquatic resources. For the climate crisis alone, we have only 10 years to eliminate 50% of all GHG emission if we wish to keep within a +1.5° C world.

Climate change is further exacerbating inequalities as a result of weather-related disasters – such as droughts, floods, storms, and heat waves as they increase in frequency and intensity. As a result, over 400 million people are expected to be vulnerable to yield losses under climate change, requiring urgent adaptation and resilience action. Innovative water and renewable energy solutions to transform agricultural production systems amid a changing climate are urgently required.

And yet, the transformation of agri-food systems offers a climate solution with more than 30% of carbon sequestration. Choosing finite natural resources pathways to low carbon and water use will be key for increasing resilience to transform agri-food systems and build positive feedback processes. Moreover, these benefits only relate to the climate emergency and the cumulative co-benefits in helping to tackle the colliding climate, nature and health emergencies also need to be taken into account.

The way food systems have evolved over past decades means that they now face major risks, which in turn threaten the future of food systems themselves, with consequential impacts on the whole of society. Different threats are adding up and and generating new risks and uncertainties. Delay will make it more complex and more to reduce the impact, to adapt to, or to mitigate these combinations of risks and crisis, as ecological tipping points and ecosystem regime shifts occur.

Resilience is the ability of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks and crises - while maintaining an acceptable level of functioning without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all.

The many components of societal and economic resilience depend on ecosystem resilience and health. Risk management requires a response hierarchy to the root causes of climate change and nature loss – that is to say, eliminate, substitute, mitigate, and compensate. Analytical frameworks that take a holistic and systems-based view of cascading risk management and impacts will help to surface potential dependencies, vulnerabilities and capacities, and will help to avoid unintended consequences in the future. Reducing risks and vulnerabilities and boosting capacity all help to strengthen resilience across systems and, especially, for the threatened agrifood systems at all levels.

4. Key tests for resilient transformation of the food system

The ambition of Action Track 5 is to ensure that food systems are regenerative and circular (see AT5 Starter paper '*Build resilience to Vulnerabilities, Shocks and Stresses*'). Resilience is a 4th essential cross-cutting element for sustainability, in addition to social, environmental and economic dimensions of sustainable development. The world's urgent issues and opportunities to solve them climate change, biodiversity loss and pollution can be tackled jointly within the framework of the Sustainable Development Goals.The Environment Working Group considers there a number of principles that any Game Changing Solutions need to meet to ensure environmental resilience:

- The basic human right to have equitable access to and benefit from a safe environment is a primary requirement of resilience
- Nature is the first line of defence against many threats
- Multiple risk management across systems (including the food system) is at the core of resilience building
- Transition pathways should be just and inclusive
- Coherence and conformity with SDGs – the outcomes of the UNFSS and proposed solutions must contribute to, and not negatively impact on, any of the SDGs.

5. The game changer is for the agri-food system to change from being part of problem to part of the solution

Environmental resilience will depend upon the principles and practice of agro-ecology, including regenerative farming and grazing practices (compared to traditional extractive approaches), as well as low carbon access and use of innovative water and energy solutions. These need to be at the centre of transformation, together with multiple risk management along entire food systems, from production to consumption. The One Health approach also helps to frame the strategy for increased resilience to many environmental and ecological issues, such as Soil Health, Ecosystem Health, Plant Health, Animal Health, and even Human Health.

Increasing the environmental resilience of the food system at all levels will not only help to secure food for all, but also will help to tackle the root causes of the intersecting climate, nature, pollution and health crises, which togther constitute the Planetary Emergency now facing humanity.

Building the environmental, economic and social resilience of food systems is essential for their transition and transformation into safe, inclusive and sustainable systems.

6. There are many steps we can take already to improve resilience

The whole global agri-food system needs to shift in a positive direction and agroecology, including regenerative practices is part of the state shift needed.

This requires a solutions strategy proportionate to the complexity of the systems, understanding of multiple interconnected risks, with multiple entry points to break into the problem and avoiding any general or one-size-fits-all solution. We have many solutions already, but many are fragmented and not context and risk specific nor people centred therefore not matching the most pressing needs and knowledge of those most at risk and marginalized.

The game-changers proposed below are context-specific and will only have an effect if advanced in combination and within a multi-level context. The AT5 Environment Working Group recommends scaling up existing and developing new tools, and the wide scale adoption of the following:

- Advance wide-scale adoption of agroecology/regenerative farming and grazing
- Long-term conservation of food diversity in gene banks and in the field, and sustained diversification of the food basket
- Sustainable soil management for safe, nutritious and resilient agri-food systems
- Adaptive human-centric approach to resilient and sustainable water management
- Ensure food value chains are safe, resilient, inclusive, just and sustainable
- Engaging with cities and local governments for resilient territories
- Promoting site-adapted agriculture assuring food security through environmental friendly techniques within a territorial approach framework
- Resilient aquaculture system
- A blue transformation to support the resilience of coastal communities, wild stocks and aquatic food systems
- Technological evolution
- Trusting customary systems for positive change in forest and agro-silvo-pastoral resources and livelihoods
- One-health approach

The Working Group does not consider these solutions to be sufficient. However, for <u>any</u> solutions to be game changing, a necessary requirement is that they must address and contribute to tackling the climate and nature crises, and related sources of conflict linked to energy and water.

In conclusion, this is an emergency. And, the need for food systems solutions is urgent. The game changer is to put climate, nature and social equity at the heart of transformation, from which more resilient societies and sustainable economic benefits will flow.

Sources of evidence and assessments [*further editing needed]* *(use UN/inter-governmental panel assessments where possible)*

- IPCCC assessment reports
- Marrakech Partnership for Global Climate Action Outcome Document Agri-food chains Roundtable
- IPBES GAR on land degradation and restoration 2018
- CFS HLPE Nutrition and Food systems 2018
- IPBES GAR on Biodiversity and Ecosystem Services 2020
- The Economics of Biodiversity: The Dasgupta Review (2021)
- The Economics of Ecosystems and Biodiversity (TEEB) (2018). TEEB for Agriculture & Food: Scientific and Economic Foundations.
- FAO, Food Systems at Risk, 2019
- WHO Biodiversity and infectious diseases
- WEF Global risks report, 2021
- UN Common Guidance on resilience, 2021 in press
- The Global Commission on Adaptation (2019)
- Malabo Montpellier Report (2019)
- UNEP*"Making Peace With Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies*
- R. Schoonover, C. Cavallo, and I. Caltabiano. "The Security Threat That Binds Us: The Unraveling of Ecological and Natural Security and What the United States Can Do About It." Edited by F. Femia and A. Rezzonico. The Converging Risks Lab, an institute of The Council on Strategic Risks. Washington, DC. February 2021.

Also:

- Financing sustainable agricultural water: http://www.oecd.org/water/Background-paper-Day1-RT-on-Financing-Agricultural-Water.pdf
- opportunities for investment cases: http://www.oecd.org/water/Background-paper-Day2-RT-on-Financing-Agricultural-Water.pdf
- Linking smart water to smart wash: http://www.fao.org/3/cb1306en/CB1306EN.pdf
- Linking water to climate smart agriculture: http://www.fao.org/3/CA1726EN/ca1726en.pdf
- Lancet food system transformation: https://eatforum.org/content/uploads/2019/01/EAT-Lancet_Commission_Summary_Report.pdf