ACTION TRACK #5:
BUILD RESILIENCE TO VULNERABILITIES, SHOCKS AND STRESS

UNITED NATIONS FOOD SYSTEMS SUMMIT 2021

AT5
SYNTHESIS OF GAME-CHANGING PROPOSITIONS
(WAVES 1 AND 2)

WAVE 1: 167 solutions received, 69 were selected (41%)
WAVE 2: 110 solutions vetted – 57 solutions selected (54%)

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INTRODUCTION

OBJECTIVE OF ACTION TRACK 5

This paper follows on the initial synthesis paper of Action Track 5, to present a second set of prioiritized game changing themes to achieve the goals of Action Track 5 (AT5). With these game changing themes, AT5 aims to build resilience to vulnerabilities, shocks and stress.

Action Track 5 will propose actions to ensure that food systems, which are affected by conflict, environmental, 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, biodiversity loss and the global climate emergency.

AT 5 has organized the work along three main themes / action areas:

- Food Systems Resilience
- Universal Access to Build Resilience
- Climate-resilient development pathways

More details for each of the action area themes are included in section.

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.

PRINCIPLES

- **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.
- **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.
- **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 the 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.

- **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 steering wheel, bottom-up and based on communities.

DEFINITION OF RESILIENCE USED BY AT5

As there had been many discussions about the definition of "resilience", the AT5 leadership team proposed using the standard definition from the UN Common Guidance on Helping Build Resilient Societies (2020).

Resilience is being defined here as "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".

ACTION TRACK 5 TEAM

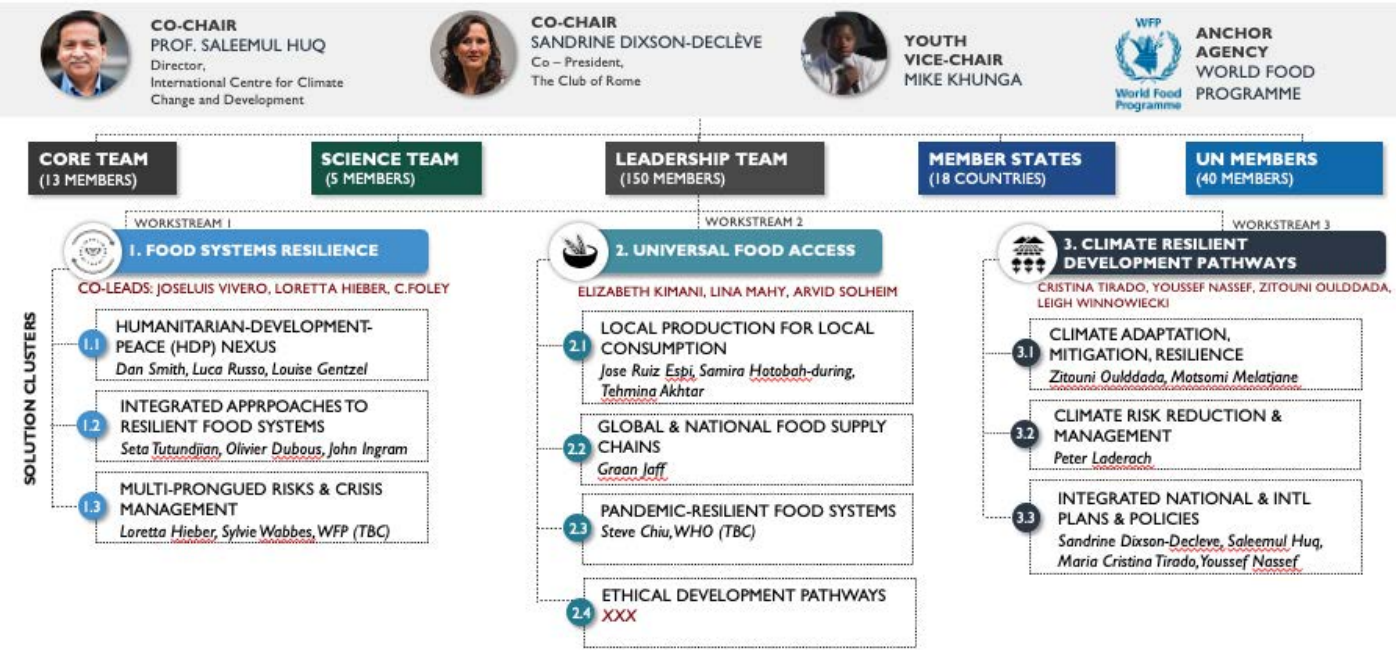
To identify, synthesize solutions and drive the AT5 action areas, AT5 has set up a leadership team. The leadership team is well-balanced in terms of gender, age, region and sector and it also includes member state representatives.

The leadership team has been divided into three main workstreams, aligning to the Action Areas of priority identified by Action Track 5, each led by the following members:

1. Food Systems Resilience:
2. Universal Access to Food
3. Climate Resilient Development Pathways

Action Areas have been divided into 10 different solution clusters, and AT5 has appointed co-leads for each solution cluster.

AT5 TEAM & WORKSTREAM STRUCTURE



Other members of Action Tracks have also been drawn to ensure inclusivity and proper integration, including cross-cutting thematic members on gender, finance, innovation, as well as Member States of AT5. The full leadership team meets once a month. The Solution Cluster working groups have begun to meet at their own schedules according to leaders and members preferences.

The UN World Food Programme as the Anchor Agency for AT5 has in its capacity actively involved its team members in the core team for internal identification and solution vetting process.

ACTION AREAS

ACTION AREA 1:
FOOD SYSTEMS RESILIENCE

CO-LEADS:

- JOSE LUIS VIVERO-POL (WFP);
- LORETTA HIEBER (UNDRR);
- CONNELL FOLEY (CONCERN WORLDWIDE)

Resilience cannot be enhanced through siloed approaches. In essence, multi-pronged approaches that tackle several problem areas simultaneously have more chance to succeed when tackling complex systems issues, both in fragile and non-fragile settings. For instance, the Humanitarian-Development-Peace Nexus (HDP Nexus) in conflict-torn food systems and food crises in fragile countries. Or the Water, Renewable Energy and Food Production (WEF) Nexus in any country. Billions of people lack safe and sufficient access to food, water, energy, peace and basic needs in those countries, coupled with a rapidly growing global demand and increasing resource constraints (overshooting the regenerative capacity of food systems). There are feedback loops between food production, water/energy/land use, biodiversity and human and planetary health. To address these challenges, the nexus approach provides a framework to identify the interactions of the WEF sectors as an integrated system to ensure policy coherence.

ACTION AREA 2: UNIVERSAL FOOD ACCESS TO BUILD RESILIENCE

CO-LEADS:

- LIZ KIMANI-MURAGE (APHRC);
- LINA MAHY (WHO);
- ARVID SOLHEIM (FIAN NORWAY)

Schemes, mirroring the public-private policy mixes that guarantee access to health and education as universal entitlements all over the world are fundamental for building resilience to future shocks and stresses. As food is an absolute daily human need and the world produces enough food for all, market mechanisms alone have proved insufficient in guaranteeing access to food for all. It is now an acceptable fact that the market alone is unfit to provide public goods. The reframing of food as a public good, as a medicine, as a human right and common good to inform different policy options, legal provisions, subsidies allocations to guarantee the universal access to food to all will be essential as we build resilience across the food value chain and ensure people's lives and livelihoods when faced with future pandemics, conflicts and environmental crises. This can be done through the universalization of specific policies (i.e. school feeding, universal basic income linked to food baskets, or minimum salary thresholds above the food basket), and the massive scale up of Employment Generation Schemes linked to adaptation/mitigation works, local procurement policies targeting small farmers, organic producers and local production, food banks as part of the public safety nets, or nutritional education as part of the national curricula. The Covid-19 Pandemic has brought the fragility of food and health systems to the forefront, with escalating food insecurity, and people with diet related illness struggling to accessing healthy food. Healthcare systems that integrate food is medicine interventions can enable more resilient systemic responses to such crises.

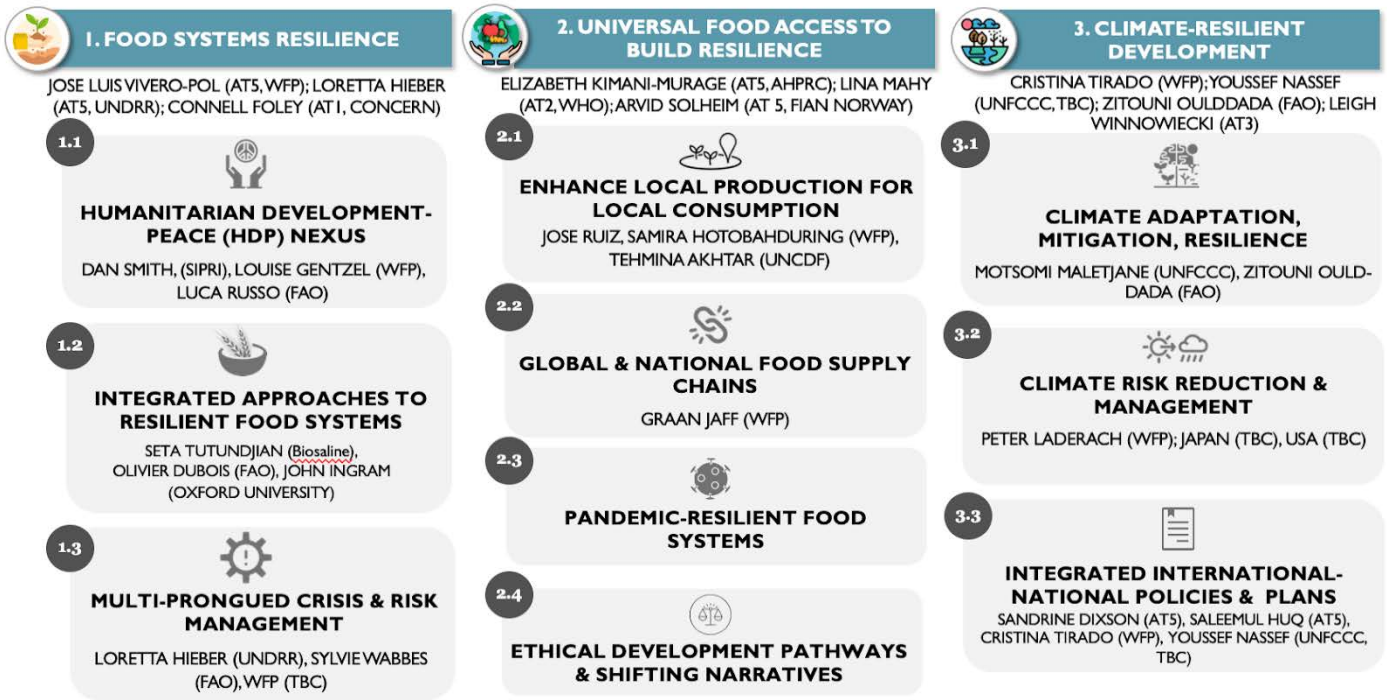
ACTION AREA 3: CLIMATE RESILIENT DEVELOPMENT PATHWAYS

CO-LEADS:

- CRISTINA TIRADO (WFP);
- YOUSSEF NASSEF (UNFCCC);
- ZITOUNI OULDDADA (FAO);
- LEIGH WINNOWIECKI (AT3)

Ensuring the integration of policy and actions to support Climate Resilient Development Pathways for food systems transformation and to meet the SDGs at national, local and global levels is necessary both to build food system resilience and to ensure a linked up systems approach during this crucial decade of action. Climate Resilient Development Pathways are development trajectories based on equity and justice, which combine climate adaptation, mitigation and climate resilient development with the goal of sustainable development. Specific actions aim to build resilience in most vulnerable people and communities in Small Island States, Coastal Areas, Deserts and Arid and Semi-arid lands. This Action area offers a space to follow-up the UNFSS, by supporting the international Policy and Action Plans for Food Systems Transformation and Resilience by 2030 and focuses on the optimisation of synergies between the Policy Frameworks related to the Paris Climate Agreement, the Sendai, CBD and UNCCD Conventions, and others that contribute to the 2030 Sustainability agenda as well as to meet Health, Nutrition, Non-Communicable Diseases Targets.

SOLUTION CLUSTERS



1.1 HUMANITARIAN-DEVELOPMENT-PEACE (HDP) NEXUS

CO-LEADS:

- DAN SMITH, (SIPRI),
- LOUISE GENTZEL (WFP),
- LUCA RUSSO (FAO)

Grounded in the experiences of local actors and data from conflict-affected communities, this Solutions Cluster will put forward solutions designed to create the conditions and structures necessary for a comprehensive approach to food systems resilience. These initiatives will support the realisation of commitments towards strengthened collaboration for anticipation and prevention, early action, response and recovery. The solutions will engage local communities, as well as humanitarian, development and peacebuilding actors. Activities at the global, regional and country levels will be linked to create mutually reinforcing channels of information and learning between theory and practice, as well as across and between different contexts.

The approach adopted by the Cluster is in line with, and seeks to support, inter alia, the UN Secretary General's Sustaining Peace Agenda, Agenda 2030 for Sustainable Development, CFS Framework for Action, the OECD DAC Recommendation on the HDP Nexus, and others. The proposal will build on, scale up and complement existing frameworks, platforms and mechanisms.

1.2 INTEGRATED APPROACHES TO RESILIENT FOOD SYSTEMS - WATER-FOOD-ENERGY NEXUS

CO-LEADS:

- SETA TUTUNDJIAN (BIOSALINE),
- OLIVIER DUBOIS (FAO),
- JOHN INGRAM (OXFORD UNIVERSITY)

This Solutions Cluster will gather all solutions enhancing integrated food systems (IFS). In IFS, by-products or services of one component of the system serve as a resource for the other production component (horizontal integration); and scarce or degraded natural resources are restored and efficiently allocated over space (vertical integration). An important aspect of IFS is that the total production from the system and its multiple benefits are valued is more important than focusing on the yield and/or efficiency of any individual production component. Due to these characteristics, IFS provide more opportunities to spread risks, manage trade-offs and identify ways to prepare and respond to them, thereby improving resource use efficiency and income opportunities; all key factors to resilient and productive food systems.

Key principles that underpin the success of the implementation of integrated food systems in their contribution to food system resilience include:

- Net zero carbon pathway
- People centred
- Leave no-one behind
- Context-specific
- Due consideration to the three dimensions of sustainability

1.3 SYSTEMIC APPROACHES TO CRISIS MANAGEMENT

CO-LEADS:

- LORETTA HIEBER (UNDRR),
- SYLVIE WABBES (FAO),
- WFP (TBC)

This Solutions Cluster brings together game changing solutions that address the management of systemic, intersecting and cascading colliding risk and crisis threatening and affecting agriculture and food systems (from production to consumption) and its resulting food security and nutrition outcomes at local, sub-national, national, regional and global levels. The game changing solutions cover the wide range of comprehensive risk prevention, mitigation and management actions linked to various shocks and stresses (including exposure, vulnerabilities and capacities) and also the management of resulting impact from disasters, crisis and conflicts on the agrifood sectors, thus strengthening resilience of food systems for food security and nutrition and sustainable development.

2.1 ENHANCE LOCAL PRODUCTION FOR LOCAL CONSUMPTION

CO-LEADS:

- JOSE RUIZ (ECHO),
- SAMIRA HOTOBAHDURING (WFP),
- TEHMINA AKHTAR (UNCDF)

The narrative shift that underpins this Solution Cluster is that local production for local consumption should be re-valued and supported by a range of policy and program measures that encourage transformational change by all food systems actors. This solution cluster takes a holistic, ecosystem approach, involving the public sector, producers, business and civil society with measures to include price policies (taxes and subsidies); finance; public investment in infrastructure, R&D and information; more effective territorial-level governance; and improved stakeholder capacity for action and cooperation.

2.2 NATIONAL FOOD SUPPLY CHAINS

CO-LEADS:

- GRAAN JAFF (WFP)

Prior to the COVID-19 pandemic, global and national food supply chains demonstrated a remarkable resilience in the face of shocks. While the impacts of COVID-19 are still unfolding, major disruptions of food supply chains due to lockdowns and restrictions triggered by government responses to the pandemic, but also a major global economic slowdown, resulted in lower incomes, and higher prices for some foods, making healthy diets even more unaffordable for many vulnerable groups. Therefore, it is necessary to foment an open and predictable national environment to ensure food can move to where it is needed. It is necessary to improve food security through efficient production and reduced losses and wastes, particularly post-harvest losses that affect mainly smallholder farmers. Reduced losses equate to greater opportunities to sell produce, while also increasing the efficiency of environmental resource use. Smallholder farmers are key to local and regional food systems. Reducing losses would result in greater food availability and accessibility for entire communities. These three ideas have the potential to transform national food systems, notably from food production through food supply chains and onto consumers. They seek to strengthen the resilience of individuals, households, and communities, from different sectors, to come together, and create productive, socially, environmentally, economically sustainable, equitable and inclusive food systems, fostering resilience and stability.

2.3 PANDEMIC-RESILIENT FOOD SYSTEMS

CO-LEADS:

- TBD

Based on the COVID experience, as a highly-disruptive shock that has affected food systems all over the world, this coalition will deal with a four-pronged compact with policy interventions that have proven to enhance resilience of food systems: a) safety nets, b) schools as hubs to secure food to children, c) civic collective actions for food based on cooperation, solidarity, mutual aid and caring for others, and d) public policies that guarantee agri-food trade flows. This coalition will be dealing with those solutions that, combined, enable food systems to cope, absorb and respond to external shocks while maintaining one of its basic features, namely feeding people adequately and guaranteeing that they are free from hunger. Actually, those four elements would be essential pillars of the Universal Food Access scheme that, mirroring those already in place in many countries for health and education, would secure that everyone gets access to enough and adequate food to get a healthy diet, either by market mechanisms, public provision or civic collective actions for food.

2.4 ETHICAL DEVELOPMENT PATHWAYS & SHIFTING NARRATIVES

CO-LEADS:

- TBD

Recognizing the need for a whole of society approach to address an equitable and just transition towards local and resilient food systems, and the critical role that behavior change plays in this process, this cluster is focused on establishing a coalition that could bring forwards, aspirational and inspirational game changing solutions, uniting faith and spiritual voices, in order to provide insights for new narratives based on ethical development pathways for Resilient Food Systems and a Just Recovery. The main action to propose through this cluster is building a coalition of stakeholders to shift narratives around food as a human right, around ethical food consumption and production, zero food waste, all building upon the outcomes of the UNFSS.

3.1 CLIMATE ADAPTATION, MITIGATION AND RESILIENCE

CO-LEADS:

- MOTSOMI MALETJANE (UNFCCC),
- ZITOUNI OULD-DADA (FAO)

This Solutions Cluster brings together game changing solutions relevant to climate change mitigation, adaptation and resilience to promote and scale-up the transformation of our food systems to be more resilient to climate and other shocks and thereby effectively contribute towards sustainable development and climate goals. The cluster also includes solutions focused on the most vulnerable countries and communities including the least developed countries, small island developing States, coastal areas, arid and semi-arid lands and deserts as well as small holder farmers including women and youth. The cluster also proposes that GHG emissions should be accounted for in food systems, to enhance transparency, facilitate public debate and informed decision-making to enable adaptation, reduce emissions and contribute to improved resilience.

3.2 CLIMATE RISK REDUCTION & MANAGEMENT

CO-LEADS:

- PETER LADERACH (CGIAR/WFP);
- ANIMESH KUMAR (UNDRR),
- JAPAN
- USA (TBC)

An unsustainable food system is vulnerable, and lacks the capacity to cope with sudden shocks. Furthermore, food systems failures can lead to crises (e.g., food insecurity, malnutrition, loss of biodiversity, desertification etc.). Crises can then reinforce exogenous shocks (e.g., create or intensify conflicts over resources). It is reasonable to assume that many crises are rooted in food system failures, and that climate plays a key role in this. Hence climate action, including climate risk reduction and management to prevent, mitigate, transfer and prepare for risks is a critical entry point for action.

This Solutions Cluster focuses on actions to **reduce the impacts of climate variability and climate-driven disasters** deploying solutions related to:

1. **Risk Prevention** (measures to avoid existing or new hazards);
2. **Risk Management** (mitigation, i.e. reducing the impact of hazards, and preparedness, i.e. anticipate, respond to, and recover from the impacts of hazards);
3. **Risk Transfer** (transferring the financial consequences of future risk from one party to another). Measures and approaches include Early Warning Systems (EWS), Climate Information Services (CIS) and insurances.

3.3 INTEGRATED NATIONAL & INTERNATIONAL POLICIES & PLANS

CO-LEADS:

- SANDRINE DIXSON (AT5 CHAIR),
- SALEEMUL HUQ (AT5 CHAIR),
- CRISTINA TIRADO (WFP),
- YOUSSEF NASSEF (UNFCCC, TBC)

This Solutions Cluster provides joined up narratives & key solutions that are cutting across the landscape of international and national policies, strategies and plans to enable and guide a transformative change towards integrated climate resilient development. This includes, at the top level, the Nationally Determined Contributions (NDCs) and the national adaptation plans (NAPs) implemented through the UNFCCC as the forefront of international action to address climate change. This entails both a wide range of planning instruments focusing on different issues (e.g. hazards, sectors, geographic regions) that bring about complementary efforts to achieve climate resilient development as well as the need for clear targets and timetables related to food system climate mitigation and adaptation policies. Several solutions will also enable greater stakeholder engagement through the Race to Zero & Race to Resilience Champions networks to underpin major stakeholder commitments from the public & private sector. Climate resilience is also increasingly becoming an inherent feature in all other regular development policies, strategies & plans hence ensuring a linked up approach with development agencies & ministries will be necessary.

OVERVIEW OF WAVE I PROPOSITIONS

About 167 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 diagram below).

The types of proposals vary greatly. Some describe policy and finance changes, levers of change, "Principles", 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.

Although for the initial synthesis paper of Wave 1, 25 solutions were selected and short-listed, after a comprehensive review of all the solutions, the track was able to retain altogether 41 solutions representing member state contribution, UN agencies, farmers and civil societies. These solutions have been clustered and mapped against the 12 solution clusters.

To date, all country solutions have been integrated in this initial selection process. The rationale behind the clustering is 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.

OVERVIEW OF WAVE 2 PROPOSITIONS

METHODOLOGY OF SOLUTION SELECTION

The ideas were identified and put forward in two waves: the call for first wave of propositions was between November 2020 and January 2021. AT5 created an online Google Form through which stakeholders and members of the public could submit their ideas. These ideas then were fed into a Master Table of solutions.

Members of Action Track 5 core team reviewed all the incoming ideas, filtered based on the depth of the solutions, and based on the UNFSS Game-changing solutions criteria described in Step 3. These solutions were then channeled to our 5 working groups in Wave 1, and 10 Solution Cluster working groups in Wave 2.

The first wave of solutions compilation was submitted to the Summit Secretariat in February. The second wave was developed in between February and April 2021.

It is important to note that this Synthesis paper comprises of compilation of merged propositions from both Wave 1 & Wave 2, mapped under thematic coalitions for action.

The initial methodology used to review the game changing solutions is described below. This is being captured into the Master Table which was shared with the Working Groups as a supporting tool for their review and selection.

Step 1: Is the solution relevant to the resilience track?

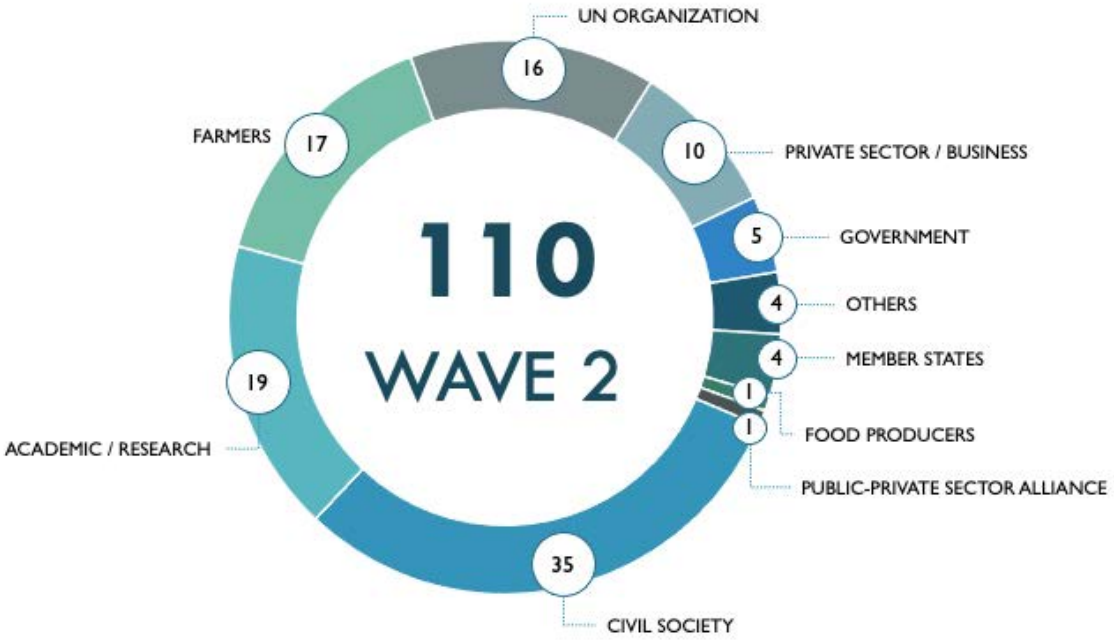
Yes, if it is targeting one of these goals:
1. Anticipate shocks
2. Prevent
3. Absorb
4. Adapt to evolving risk scenario
5. Transform the Food System, when the current Food System is no longer sustainable.

Step 2: If not relevant as a techno-political solution, is it relevant to another track (AT1,2,3,4) , or does it fit better as a proposal for to be considered for "governance and institutional architecture" or "ethics, principled debates and narratives of transition"?
Those two realms of action (governance and ethics) will be adequate platforms to interact and articulate with the four levers of change, and with member states and international institutions that may show specific interest on any given thematic package or individual action.

Step 3: Are the solutions "game-changing", and meeting the UNFSS top 3 criteria

- **Impact potential at scale** (incl. return on investment)
- **Actionability** (politics, capacity, costs, availability of funds for implementation)
- **Sustainability** (the ability to keep delivering to 2030 and beyond)

Altogether AT5 received 109 solutions from different stakeholders, namely Farmers, UN Agencies, Private Sector, Government, Food Producers and Civil Society and Member States. Majority of solutions received were from civil society representatives (31%) and 17% of solutions were received from Academia, with 16% of solutions from Farmers.



All the solutions were thoroughly reviewed and 57 solutions, out of 109 were selected and mapped against the solution clusters. See the diagram below for more information.

Altogether, AT5 has received 273 solutions in both Wave 1 and 2, with majority of solutions coming from Civil Society (26%) and 19% from Member States and Academia.


277
TOTAL SOLUTIONS FOR AT5
(WAVE 1 + 2)
WAVE 1
167
WAVE 2
110
41
PAPER SOLUTIONS
69
SURVEY SOLUTIONS
TOTAL SOLUTIONS
MEMBER STATES 51
ACADEMIA / RESEARCH 50
UN ORGANIZATION 29
PRIVATE SECTOR / BUSINESS 28
FARMERS 19
OTHERS 19
CIVIL SOCIETY 74
5 GOVERNMENT
1 FOOD PRODUCERS
1 PUBLIC-PRIVATE SECTOR ALLIANCE
SHORTLISTED SOLUTIONS
69 WAVE 1 + 57 WAVE 2
Merged & embedded to
10
SOLUTION CLUSTERS
with
27
THEMATIC COALITIONS

WAVE I & WAVE 2
THEMATIC COALITIONS

AT5 SOLUTIONS MERGED FROM WAVE I & 2

Note: ***Wave 1 solutions in BLUE.***
WAVE 1: 167 solutions received, 69 were selected (41%) (in blue below)
WAVE 2: 110 solutions vetted – 57 solutions selected (54%) (in black below)
After merging: 105 solutions in 10 Solution Clusters and 27 Thematic Coalitions

LIST OF THEMATIC COALITIONS

Those Thematic Coalitions marked with (*) are Solution Clusters and Thematic Coalition at the same time.

ACTION AREA 1: FOOD SYSTEMS RESILIENCE	1. HUMANITARIAN-DEVELOPMENT-PEACE NEXUS* 2. AGROECOLOGY FOR RESILIENCE 3. WATER-ENERGY-FOOD NEXUS 4. UNDERSTANDING AND FORECASTING FOOD CRISES 5. MULTI-RISK EARLY WARNING SYSTEMS & ANTICIPATORY ACTIONS 6. SYSTEMIC MULTI-RISK AND CRISIS GOVERNANCE, INCLUDING RISK INFORMED FINANCE & INVESTMENTS/INSURANCE 7. VULNERABILITY AND RISK REDUCTION MEASURES AT FIELD LEVEL
ACTION AREA 2: UNIVERSAL FOOD ACCESS TO BUILD RESILIENCE	8. LOCAL FOOD SYSTEMS FOR LOCAL PRODUCTION 9. PUBLIC PROCUREMENT 10. INCREASING WOMEN'S AGENCY FOR RESILIENCE THROUGH ECONOMIC EMPOWERMENT 11. SECURING ACCESS TO LAND & RESOURCES 12. NATIONAL FOOD CHAINS 13. FOOD STORAGE FACILITIES 14. POLICY AND INSTITUTIONAL INNOVATIONS FOR RURAL AREAS 15. PANDEMIC-RESILIENT FOOD SYSTEMS* 16. ETHICAL DEVELOPMENT PATHWAYS*
ACTION AREA 3: CLIMATE RESILIENT DEVELOPMENT PATHWAYS	17. INNOVATION ON CLIMATE ADAPTATION 18. INNOVATION FOR CLIMATE MITIGATION 19. SMALL ISLAND STATES AND COASTAL AREAS 20. ARID, SEMI-ARID LANDS AND DESERTS 21. CLIMATE INSURANCE PRODUCTS 22. CLIMATE EARLY WARNING SYSTEMS 23. INTEGRATING RESILIENCE IN, AND ALIGNING NAPS, NDCS, DRR & SDGS IN NATIONAL POLICIES & PLANNING 24. RESILIENCE FRONTIERS FOR LONG-TERM RESILIENT FOOD SYSTEMS 25. INVESTING IN CLEAN ENERGY & GREEN & INCLUSIVE RECOVERY

Three Thematic Coalitions are in the making, with contacts already initiated but the specific solution was not received at the moment of finalising this report.

A. RISK PROOFING OF INFRASTRUCTURES ALONG THE FOOD VALUE CHAIN
(PLACEHOLDER to be filled with UNDRR support)

B. CLIMATE JUSTICE AND RESILIENT DEVELOPMENT
(PLACEHOLDER to be filled by Mary Robinson Foundation)

1.1 HUMANITARIAN-DEVELOPMENT-PEACE (HDP) NEXUS

CO-LEADS:

- DAN SMITH, (SIPRI),
- LOUISE GENTZEL (WFP),
- LUCA RUSSO (FAO

1. HUMANITARIAN-DEVELOPMENT-PEACE NEXUS*

World hunger is increasing, driven by violent conflict, climate change and economic shocks exacerbated by the COVID-19 pandemic. According to the 2021 Global Report on Food Crises, conflict was the primary driver of crisis-level acute food insecurity or worse for almost 100 million people, including an additional 22 million people in 2020 alone.

Despite ample evidence that food insecurity can exacerbate violent conflict and that violent conflict is a primary driver of food insecurity, policy and programming by donors and agencies routinely overlook these dynamics. As part of efforts to tackle root causes and drivers of conflict, peacebuilding efforts must address issues of food insecurity, while interventions designed to strengthen food systems must be aware of conflict dynamics. Lack of attention to these interacting problems means interventions risk having a limited impact and may even exacerbate existing fragilities.

SUPPORTING INTEGRATED APPROACHES TO ADDRESSING FOOD CRISES	Grounded in the experiences of local actors and data from conflict-affected communities, this working group will put forward solutions designed to create the conditions and structures necessary for a comprehensive approach to food systems resilience. These initiatives will support the realisation of commitments towards strengthened collaboration for anticipation and prevention, early action, response and recovery. The solutions will engage local communities, as well as humanitarian, development and peacebuilding actors. Activities at the global, regional and country levels will be linked to create mutually reinforcing channels of information and learning between theory and practice, as well as across and between different contexts. The approach adopted by the group is in line with, and seeks to support, inter alia, the UN Secretary General's Sustaining Peace Agenda, Agenda 2030 for Sustainable Development, CFS Framework for Action, the OECD DAC Recommendation on the HDP Nexus, and others. The proposal will build on, scale up and complement existing frameworks, platforms and mechanisms.
THEORIES OF CHANGE	The work of the coalition is underpinned by three core theories of change: 1. **If** local communities, as well as national and international humanitarian, development, peacebuilding actors, researchers and funders, have a common understanding of the interactions between conflict and food insecurity, **then** prevention, anticipatory and early action, response and recovery interventions can be designed to maximise their contribution to positive peace. 2. **If** these interventions by peacebuilding, humanitarian, and development actors are coherent, complementary and evidence-based, **then** collective efforts will strengthen sustainable food systems and resilient food systems will enhance the prospects of positive peace. 3. **If** the humanitarian, development, and peacebuilding policy communities have a common understanding of the 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 prevent the deterioration of food systems and enhance the prospects of peace.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	1	**FNS-REPRO- Building Food System Resilience in Protracted Crisis / Fragile Settings** for improved FNS outcomes. Knowledge-based tools: Resilience Baseline (RIMA); multi-disciplinary context analysis (value chains, HDP Nexus, natural resources, conflict and gender assessments), and Food System Resilience Assessment Tool. (FAO, Wageningen University, The Netherlands, NGOs)
	2	**Climate Security Observatory:** qualifying and quantifying the "Climate-Security Nexus" in real time through monitoring, assessment and forecasting evidence to inform peace and security programming, policy and finance. Climate as "threat multiplier" of land, water and food systems risks and insecurities that could impact on peace and security globally. Real time monitoring & forecasting using big data and machine learning approaches (CGIAR)
	3	**Doubling the livelihoods investment in conflict-affected contexts and countries at high risk** of extreme weather events. This proposal aims to deliver a commitment from development donors to improve the targeting of their livelihood investments, to strengthen the resilience of individuals, households, and communities to protracted conflict and climate-related shocks. The UNFSS offers a unique opportunity to broker such a commitment. Parallel social assistance to meet basic consumption needs as a prerequisite for supporting livelihoods. Collaboration between humanitarian, development and peacebuilding agencies across the nexus (UK).
	4	**Global Network against Food Crises** - Operates at national, regional and global level along three interlinked dimensions - i) understanding food crises - evidence-based information and analysis, ii) leveraging strategic investments to prepare, prevent and respond to food crises; and iii) fostering political uptake and functional coordination. (FAO/WFP, EU, France)
	5	**Food and Peace Hubs**– Multidisciplinary hubs made up of national and international actors, local communities, researchers and funders in countries/regions facing the identifiable risk, reality or aftermath of violent conflict. Hubs integrate and aggregate existing/new activities, including other solutions developed across the FSS. Each hub connects to the Global Network. (Peace & Resilience WG)
	6	**Global Centre for Risk Assessment and Policy Response on Conflict and Hunger** – Brings together experts with HDP actors and agencies to establish a common understanding for risk management in food-insecure conflict-affected settings. While Food and Peace Hubs will focus on analysis, strategies and programming, the Centre focuses on policy and instruments. (Peace & Resilience WG)
	7	**Humanitarian-Development-Peace Nexus to Minimize Future Humanitarian Needs**– Policies and activities focused on the sources of resilience and the tools policymakers need to prepare for, adapt to, and respond to shocks and stresses. (USA)

1.2 INTEGRATED APPROACHES TO RESILIENT FOOD SYSTEMS - WATER-FOOD-ENERGY NEXUS

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There is increasing agreement that food systems have caused significant environmental damage (in particular water pollution and depletion, land/soil degradation, reduced resilience to changing and extreme climate conditions, and biodiversity) which disproportionately affect smallholders, small and medium agribusiness actors and local people. Given these stresses and often-related shocks, ensuring the resilience of the food systems and sustainable management of natural resources requires holistic, context-based, and people-centred approaches that both address short-term needs and embrace a long-term vision.

In Integrated Food Systems (IFS), by-products or services of one component of the system serve as a resource for the other production component (horizontal integration); and scarce or degraded natural resources are restored and efficiently allocated over space (vertical integration). An important aspect of IFS is that the total production from the system (and its multiple benefits) is more important than just focusing on the yield and/or efficiency of any individual production component. Due to these characteristics, IFS provide more opportunities to spread risks, manage trade-offs and identify ways to prepare and respond to them, thereby improving resource use efficiency and income opportunities; all key factors to resilient and productive food systems.

Key principles that underpin the success of the implementation of integrated food systems in their contribution to food system resilience include:

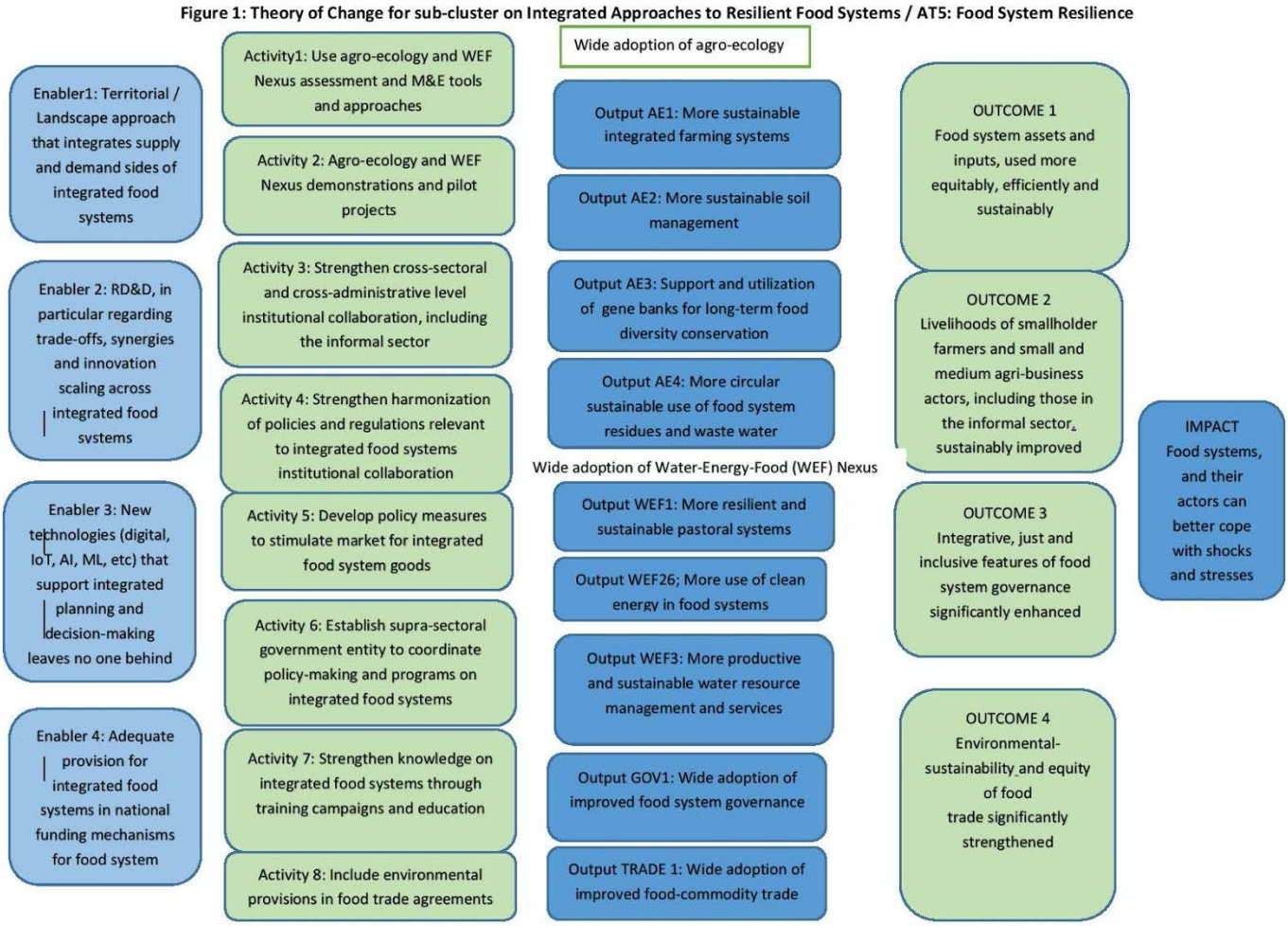
a) Net zero carbon pathway
b) People centred
c) Leave no-one behind
d) Context-specific
e) Due consideration to the three dimensions of sustainability.

The Theory of Change (TOC) presented in Figure 1 below proposes solutions/outputs related to the wide adoption of territorial, agroecology water-energy-food nexus approaches, as these are widely recognised to enhance the above-mentioned key features of successful food system resilience. Improved food system governance and food commodity trade are additional key outcomes needed to ensure that integrated food systems contribute to food system resilience in a meaningful and sustainable manner, while sustaining land and water resources and biodiversity as well as a wide array of ecosystem services.

The activities proposed in the TOC address the major barriers to the adoption of IFS, which include technical knowledge, important trade-offs, poor access to markets, implementation costs, and lack of coordination among sectors, administrative levels and food chain actors. Operators and practitioners would carry out activities related to the use of approaches and tools and the implementation of projects; while governments would be in charge of those related to policies, regulations and institutional arrangements, with or without external support by international development partners. However, a key success factor of integrated food systems lies in multi-stakeholder collaboration between government, private sector and civil society actors and good governance in the design and implementation of related policies and programmes, backed up by monitoring and doom for adaptation.

Finally, some key enablers are suggested and, as such need to be given due consideration to achieve the implementation of integrated food systems at scale. This action for resilient food systems would significantly contribute toward achieving the SDGs and the Paris Agreement targets.

FIGURE 1: FOOD SYSTEM *ACTIVITIES* LEADING TO FOOD SYSTEM *OUTCOMES.*



2. AGROECOLOGY FOR RESILIENCE

WHAT IS THE IDEA ABOUT?	The HLPE 14 (HLPE, 2019)[1] report identifies 13 principles that guide the agro-ecological approach. These are to be applied based on the local context: recycling; reducing the use of inputs; soil health; animal health and welfare; biodiversity; synergy; economic diversification; co-creation of knowledge by embracing local knowledge and global science; social values and diets; fairness; connectivity; land and natural resource governance; and participation. These factors highlight the need for an integrated and multi-disciplinary approach that includes ecological, sociocultural, technological, economic and political dimensions of food systems from production to consumption with the various actors with the system. It also stresses the importance of maintaining if not enhancing biological processes, as well as valuing and utilizing indigenous knowledge and cultural values.
WHY IS THE AGROECOLOGICAL APPROACH IMPORTANT FOR FOOD SYSTEMS' RESILIENCE?	Wide-scale adoption of agroecology results in more sustainable integrated farming systems through more sustainable soil and water management; integrated farming systems, better nutrient use; the utilization of gene banks for long-term food diversity conservation, and pastoral systems management. Moreover, its integrated practices tackle poverty, hunger, inequality, as well as production and consumption practices. To accelerate socio-ecological transitions towards sustainable agriculture and food systems that benefit from holistic and people-centred approaches that embrace a long-term vision are important. These include agro-ecology, which is increasingly acknowledged for its potential to bring about transformative changes required to meet the SDGs.
WHY WILL THE AGROECOLOGICAL APPROACH WORK?	As regards evidence on the positive role of agro-ecology on food systems' resilience, for instance, in a survey conducted after Hurricane Mitch in Central America, it was found that farmers who were practicing diversification experienced less damage and economic loss in their farms than their specialized neighboring farms (Holt-Giménez, 2002), thereby enhancing resilience. Other studies have also found a positive relationship between diversified farming systems and household dietary diversity and nutrition (HLPE 2019). In Kenya, Ndiso et al. (2017) found cowpea-maize intercropping to result in higher soil moisture content than single maize; while in Mexico, the use of agroforestry in coffee production was able to maintain high levels of soil moisture compared to a single crop (Lin 2007). In both cases, the use of these integrated systems resulted in higher yields. The value of integrated and diversified agricultural activities within the farming systems, in particular the role of agroecology and diversity in reducing vulnerability against climate variability and extreme weather events, is recognized in the IPCC Special Report on Climate Change and Land (IPCC, 2019). According to this report, the diversification of different aspects of food systems is a crucial element for enhancing performance and of mineral fertilizers and the climate mitigation co-benefit (Leippert 2019) is another important benefit efficiency that could manifest into increased resilience, reduced risks, and maintained stability of food production in the wake shocks and stresses. The potential of agroecology in increasing soil carbon content and reducing use of chemical inputs (fertilizers and pesticides).

[1] HLPE. 2019. Agro-ecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

	An increasing number of key recent reports identify agro-ecological principles as the core for restoration and adaptation. For example, the Global Adaptation Report (2019) lists nature-based solutions. Similarly, the FOLU (2019)[2] Ten Critical Transitions to Transform Food and Land Use also include agroecology principles. The FAO's (2020)[3] on the next decade's work on restoring the earth is built around agro-ecology principles. Baker et al. present many case studies in their Beacons of Hope[4]. Nonetheless, there is still considerable debate around agroecology with some contesting the validity of existing data and calling for the need for further documentation (Leippert 2019; HLPE 2019).
HOW WILL THE AGROECOLOGICAL APPROACH WORK?	The scaling up of agro-ecological approaches represents a promising systemic solution that encourages transformative change and supports socio-ecological transitions towards sustainable agriculture and food systems. Key questions to scaling agroecology are: • How to operationalize agroecology 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 with interested stakeholders. Recognizing that the inherent complexity of achieving sustainability is commonly seen as a deterrent to decision-making, following an extensive multi-stakeholder consultative process between 2014 and 2018, FAO has approved the 10 Elements of Agroecology[5,6] as an analytical framework to support the design of differentiated paths for agriculture and food systems transformation. This framework aims to facilitate 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)[7,8] assesses 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 agro-ecological 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).

[2] FOLU (Food and Land Use Coalition). (2019). Growing Better: ten critical transitions to transform food and land use. Available Online: https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf
[3] FAO. 2020. Restoring the Earth – The next decade. Unasylva No. 252 - Vol. 71 2020/1. Rome. https://doi.org/10.4060/cb1600en
[4] Baker, L., Gemmill-Herren, B. & Leippert, F. 2019. Beacons of Hope: Accelerating Transformations to Sustainable Food Systems [online]. Global Alliance for the Future of Food. [Cited 06/04/2020]. https:// foodsystemstransformations.org/wp-content/uploads/2019/08/BeaconsOfHope_Report_082019.pdf
[5] FAO 2018. The 10 Elements of Agroecology: Guiding transitions to sustainable food and agricultural systems. Rome. http://www.fao.org/3/i9037en/I9037EN.pdf
[6] Barrios et al. 2020. The 10 Elements of Agroecology: enabling transitions towards sustainable agriculture and food systems through visual narratives, Ecosystems and People, 16:1,230-247, https://doi.org/10.1080/26395916.2020.1808705
[7] FAO 2019.Tool for Agroecology Performance Evaluation: Process of development and guidelines for application http://www.fao.org/3/ca7407en/ca7407en.pdf
[8] Mottet et al. 2020. Assessing Transitions to Sustainable Agricultural and Food Systems: A Tool for Agroecology Performance Evaluation (TAPE), Frontiers in Sustainable Food Systems, 16 December 2020, https://doi.org/10.3389/fsufs.2020.579154

	Then, the evidence can be utilized and coupled with the 10 Elements framework to analyze 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 of the food systems.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	8	**Resilient Food Systems in Nepal.** The solution is trying to improve or enhance resilience of food systems in three ways i.e., diversifying local resources and natural resources, diversifying economic resources, and diversifying social networks and partners in both forest and farmland (IUCN, Nepal)
	9	**Scaling up of conservation agriculture to improve smallholder farmers' resilience in Zimbabwe**: soil management practices and crop rotations (Zimbabwe Farmers' Union)
	10	**Farmers' resilience to cope with climate and Covid-19 shocks in Canada (Quebec):** trees as hedgerows, mulching, rotation with leguminous (World Farmers' Organization)
	11	**Advance wide-scale adoption of agro-ecology within farms and rangelands**. Agroecology performance Evaluation Tool (FAO).
	12	**Integrated approach for sustainable and resilient soil management** (Global Soil Partnership)
	13	**Long-term conservation of food diversity in gene banks and in the field, and sustained diversification of the food basket**. (SoAR, Croptrust, ICBA)
	14	**Promoting site-adapted agriculture assuring food security through environmentally friendly techniques within a territorial approach framework** (Welthungerhilfe)

3. WATER-ENERGY-FOOD NEXUS

WHAT IS THE IDEA ABOUT?	The Water-Energy-Food (WEF) Nexus offers an approach to sector planning, policy and technology decisions that identifies potential trade-offs and explores synergies in their production and use, taking into account the finite amounts of (and often stressed) natural resource assets, and the challenges of climate change. Examples of trade-offs include risk of over-pumping in solar energy irrigation due to the no-cost character of solar energy, high energy needs to desalinate water to be used in agriculture, and use of water for biogas at the expense of water for food or animal feed in arid regions. Examples of possible synergies include the production of biogas from food residues and wastewater treatment, and renewable energy systems used for food systems and pumping good quality water for households, schools and health centres.
WHY IS THE WEF NEXUS APPROACH IMPORTANT FOR FOOD SYSTEMS' RESILIENCE?	Water and energy are major resources needed in food systems. Agriculture is the largest user of the world's freshwater resources, accounting for 70% of total global water withdrawal and an estimated 30% of global energy consumption occurs along food supply chains, contributing ca. 30% of anthropogenic GHGs. This is already unsustainable and the situation will get worse if we continue doing 'business-as usual' due to climate change, and natural driven by increasing food demand, sources degradation. These three factors are particularly relevant to the need to enhance food systems' resilience. In that context, an integrated approach is required to account for the close links between water, energy and food in addressing the daunting challenge of fulfilling simultaneous demands in these sectors in a sustainable manner. By addressing trade-offs and synergies such as those mentioned above, the WEF Nexus approach contributes to five key factors needed to help achieve food systems' resilience: • Coping with shocks and stresses, by ensuring adequate amount of water and energy for local people and food systems' actors; • Linked to the above, optimizing the efficiency of local water and energy production and use in local food systems; • Linked to the above, for private agri-food operators, reducing the risk of water and energy shortages and reducing costs related to their use. • Providing food chain actors with a diversity of income generation options, including local green jobs related to renewable energy and water management systems and the possibility to sell excess food chain energy to the grid; and • Helping to reorient food system outcomes towards a less-demanding future thereby enhancing both resilience and sustainability.
WHY WILL THE WEF NEXUS APPROACH WORK?	There is now ample evidence regarding trade-offs and synergies between the use of water and energy in food systems. Fader et al, (2018)[9] in particular relate these to SDG 2, 6 and & targets, hence providing very useful information to policy makers regarding the fulfilment of these SDGs in their countries. This contributes to making food systems less vulnerable and optimizing relationships between the water, energy and food sectors, so that the benefits in one sector are spread among the other two and in fact among almost all other SDGs. Practical examples of the benefits of using a WEF Nexus approach in designing and implementing energy, water and food system projects, and examples on how it has been applied, can be found for instance in the WWF

[9] Fader, M; Cranmer, C.; Lawford, R. and Engel-Cox, Jill (2018). Toward an Understanding of Synergies and Trade-Offs Between Water, Energy, and Food SDG Targets , Frontiers in Environmental Science , Vol 6 -https://www.frontiersin.org/article/10.3389/fenvs.2018.00112

	SAB Miller (2014[10]), FAO (2014)[11], IRENA (2015)[12] and BMZ (2018)[13] reports.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	15	**Strengthening technical and entrepreneurial capacities in African countries and universities to deploy renewable energy for rural areas and agricultural activities**. Develop critical human capital to run the renewable energy sector; strengthen research to generate local energy capacity; transitioning and adopting production systems in agriculture and health to utilise renewable energy (RUFORUM: Regional Universities Forum for Capacity Building in Africa)
	16	**Agricultural water stewardship and accompanying regulations and policies to incentivize low carbon and water (re)use pathways of our agri-food systems** (e.g. tax/importation, water, or carbon credits). Align sectoral policies related to water, agriculture, WASH, energy, climate, gender, and social inclusion where relevant (IWMI, CGIAR)
	17	**Circular economy of bamboo production in Italy:** main product for the furniture industry and waste and unsold parts to be used for electrical and thermal energy (World Farmers' Organisation).
	18	**Farmers adapting to climate change with a Water-Food-Energy nexus in Belize:** securing well-functioning value chains during crisis through diversifying production, new livestock races, water harvest, forage species (Cayo Rural Farmers Alliance. World Farmers' Organisation)
	19	**Watershed management in Jamaica:** in the Rio Minho watershed, micro-dams for irrigation and sustainable water harvesting techniques (Jamaica Network of Rural Women Producers).
	20	**Water-Food-Energy Nexus & sustainable water management.** Adaptive human-centric approach to resilient and sustainable water management. (IRENA, HL Energy, IWMI-CGIAR)

[10]WWF & SAB-Miller (2014). The water-food-energy nexus: Insights into resilient development - https://www.environment.gov.za/sites/default/files/docs/waterfood_energynexus2014.pdf 3.
[11] FAO (2014) Walking the Nexus Talk: Assessing the Water-Energy-Food Nexus in the Context of the Sustainable Energy for All Initiative - http://www.fao.org/3/i3959e/i3959e.pdf
[12] IRENA (2015). Renewable energy in the water, energy and food nexus - https://www.irena.org/publications/2015/Jan/Renewable-Energy-in-the-Water-Energy--Food-Nexus
[13] BMZ (2018). The Water-Energy-Food Security Nexus – A review of Nexus literature and ongoing Nexus initiatives for policy-makers - https://uploads.water-energy-food.org/legacy/wef_nexus_literature_review.pdf

1.3 SYSTEMIC APPROACHES TO CRISIS MANAGEMENT

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4. UNDERSTANDING AND FORECASTING FOOD CRISES

THEORY OF CHANGE	With the ongoing COVID-19 pandemic and its wide effects throughout society, uncertainty has become a buzzword of our times marked by an ongoing human health crisis which aggravates unfolding global emergencies associated with climate change, biodiversity loss, pollution and conflicts and an overall rise in food insecurity and malnutrition. We are at an unprecedented moment in history, the Anthropocene, in which human activity has become a dominant force shaping the planet. Non-linear and unexpected change seems increasingly prominent, and surprise and turbulence is more common than before. Overlapping and complex problems call for complementary and transformative solutions in multiple risk and crisis management, especially for agriculture and food systems. Problem: In the face of current and future crises, how to reduce risks, vulnerabilities, impacts and build capacities to manage multiple risks and crisis across and within sectors for building the resilience of agri-food systems and ensuring food security and nutrition for all? Theory of Change: If we manage interconnected and multiple risks and crises, from production to consumption, then we can build the resilience of agri-food systems, so they transform from being part of the problem to becoming part of the solution, and can better sustain dealing with uncertainty. Systemic risk and crisis management requires investing at scale in a suite of mutually complementary actions or interventions, including acute and chronic food security and nutrition monitoring systems at all levels from local to global.
WHAT IS THE IDEA ABOUT?	Food insecurity and malnutrition are the expression of cascading risks and crises which create hunger and malnutrition in all its forms. This thematic coalition idea brings together game changing solutions that address the management of systemic, intersecting, and cascading colliding risks and crises threatening and affecting agriculture and food systems (from production to consumption) and its resulting food security and nutrition outcomes at local, sub-national, national, regional, and global levels. The game changing solutions in this thematic coalition emphasize the need to improve and expand acute and chronic food security monitoring based on the Integrated Food Security Phase Classification (IPC) methodology, building upon the latest digital technologies, innovation, and outreach, and to use the indicators of these resources as guides for ex ante resilience building.
WHY IS IT NEEDED?	COVID-19 has highlighted long-standing weaknesses in the humanitarian system for food crises and famine prevention: The world does not have a singular source of food security and nutrition information to detect emerging crises and rapid deterioration in ongoing crises in any country of concern early enough to adjust ongoing response and trigger preventative, anticipative and adaptive action.

	The world needs a system which provides: 1. Real-time assessments and forecasts of acute food insecurity 2. The geographic scale to cover any country of concern 3. The rigor and standards of a global reference system 4. The ability to be updated frequently and consistently in near real-time 5. An analysis base built on evidence and multi-stakeholder consensus.
WHY WILL IT WORK?	The IPC is uniquely positioned to become a 'single trusted source' of both acute and chronic food security and nutrition information. Already, the IPC (and its companion in West Africa, the *Cadre Harmonisé*) is the primary source of estimates of acute food and nutrition insecurity in about 45 countries and informs the allocation of over $7 billion of humanitarian assistance annually. The IPC success is due to a number of factors, including: 1. the IPC is a globally accepted standard for classifying the severity and magnitude of food insecurity that enables comparability of analysis across countries and over time 2. the IPC is governed by a multi-agency partnership of UN, NGOs, technical agencies, and regional government 3. the IPC approach is to make the best use of existing information and to draw together data from a wide variety of sources, 4. the IPC uses an evidence and consensus-based approach to ensure quantitative rigor and multi-stakeholder inputs into classifying food and nutrition insecurity, and 5. the IPC is designed to link information directly with actions that can mitigate both acute and chronic food insecurity and thus increase resilience and reduce risk for vulnerable populations.
HOW WILL IT WORK?	Proposed Game-Changing solutions under the thematic cluster *Data Collection, Agro-climatic and disaster/crisis risk, and food security information systems*: This thematic coalition proposes to improve and expand the IPC methodology to evolve into the IPC Global Platform. The approach will build upon existing successes and evolve the IPC into a truly Global Food Security Analysis and Monitoring Platform which is designed to have multi-stakeholder partnerships and governance and to be a global public good to serve the needs of decision makers at national, regional, and global levels to design humanitarian and development-oriented risk-informed interventions to build resilient food systems and to reduce risk of the world's vulnerable populations to food and nutrition insecurity for achieving SDG 2. Creating the IPC Global Platform will necessitate bold innovations in three areas: 1) use of advanced technologies such as artificial intelligence, machine learning, and big data to automate data management and analysis wherever possible, while still engaging human experts for nuanced and risk and contextual analysis and consensus building 2) strengthened institutional partnerships and accountable commitments for data sharing and joint analysis among leading food security and nutrition agencies, and 3) revision of IPC analysis protocols to ensure that analysis can cover any country of concern in near real time. 'Everywhere, all the time' is the motto of the IPC Global Platform Vision. Building upon the existing IPC partnership, the IPC Global Platform would be governed by the multi-agency partnership of UN, NGO, governmental, and technical agencies; and managed by the IPC Global Support Unit hosted at the Food and Agriculture Organization of the United Nations, with large support from UK, USA and EU.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	21	Global Food Security Analysis and Monitoring Platform to provide a unified source of data on acute food insecurity: the IPC methodology "going global". The platform is expected to use Artificial Swarm Intelligence to further improve the scope of data, expert analysis and consensus-based decision making. Achieve robust global end-to-end food security forecasting and monitoring and enable relevant interventions to maximize their support to inclusive and sustainable food security (UK).
	22	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. Food Security Forecasting and Monitoring and Early Warning System (USA).

5. MULTI-RISK EARLY WARNING SYSTEMS AND ANTICIPATORY ACTIONS

THEORY OF CHANGE	With the ongoing COVID-19 pandemic and its wide effects throughout society, uncertainty has become a buzzword of our times marked by an ongoing human health crisis which aggravates unfolding global emergencies associated with climate change, biodiversity loss, pollution and conflicts and an overall rise in food insecurity and malnutrition. We are at an unprecedented moment in history, the Anthropocene, in which human activity has become a dominant force shaping the planet. Non-linear and unexpected change seems increasingly prominent, and surprise and turbulence is more common than before. Overlapping and complex problems call for complementary and transformative solutions in multiple risk and crisis management, especially for agriculture and food systems. Problem: In the face of current and future crises, how to reduce risks, vulnerabilities, impacts and build capacities to manage multiple risks and crisis across and within sectors for building the resilience of agri-food systems and ensuring food security and nutrition for all? Theory of Change: If we manage interconnected and multiple risks and crises, from production to consumption, then we can build the resilience of agri-food systems, so they transform from being part of the problem to becoming part of the solution, and can better sustain dealing with uncertainty. Systemic risk and crisis management requires investing at scale in a suite of mutually complementary actions or interventions including (a) multi-risk early warning systems with actionable alerts across and within agriculture and food related sectors, and (b) anticipatory actions.
WHAT IS THE IDEA ABOUT?	Multi-risk early warning (EW) systems, supported by digital platforms, and linked to contingency planning, anticipatory action, and emergency response (including shock responsive social protection and insurance schemes), with actionable alerts across and within agriculture and food related sectors are essential for building resilient agri-food systems. EW systems, as part of information systems, can help to reduce the impact of multiple hazards. Optimally, EW systems provide localized, timely, relevant, reliable, and accurate multi-hazard alerts, which help to prevent, mitigate, and better prepare for adverse effects on lives and agriculture and food-based livelihoods. When timely alerts can be issued well before an event, it enables people at all levels to take more accurate decisions and early actions to help protect lives, livelihoods, assets, property, and infrastructure. Governments, local administrations, enterprises, communities, and farmers should be able to receive and react to early warnings, thereby initiating early actions (e.g., contingency planning, prepositioning of supplies, people, and assets such as seed, livestock, food reserves). Triggers for early action should exist as well as flexible or forecast-based financing, which ensures that mechanisms are in place to release funding for the implementation of the anticipatory actions. Anticipatory Action (AA) is an approach that links early warnings to flexible financial instruments and technical interventions in order to trigger actions that mitigate the impact of forecast shocks on the most vulnerable people. AAs are short-term disaster risk management interventions that are implemented during the critical time window between an early warning trigger (point in time when it is known that a shock is likely to occur in the near future) and the actual occurrence of the shock. A change in thinking from managing disaster *response* to managing disaster *risk* is a fundamental shift required to ensure

	resilient food systems and communities do not fall into dependence on humanitarian assistance after each shock.
WHY IS IT NEEDED?	It is important to monitor and predict, as much as possible, multiple risk of disasters, crisis and conflicts, their likelihood of occurrence and their effects on the agriculture and food sectors. Such multiple risk monitoring and EW systems must be coupled with timely and actionable alerts to trigger accurate decision-making at institutional, business, city, territory, community, and individual levels. Monitoring multiple risks helps prevent, prepare for, and reduce the impact of diverse shocks and stresses and therefore avoid crisis with its associated loss of lives, human suffering, and socio-economic and environmental costs. Multiple risk EW systems must include specificities and interconnection of risks from geophysical, climate and weather-related, ecosystem/environmental, biological, technological, economic, and political and governance events. Regular monitoring of high impact transboundary animal and plant diseases or pests, such as locusts, have helped avert major food chain crises over the years. In protracted crisis situations with violent conflicts, multi-risk monitoring systems coupled with regular monitoring of food security and nutrition indicators can mean the difference between life and death for millions of people. In hazard-prone areas and protracted crisis situations, in addition to specific or individual shock and stress threat monitoring, systematic assessments and analyses of damages and losses, and of vulnerability and overall resilience at household and communities' levels, must also inform the analysis. The unsustainability of the current model of responding to food crises has become more apparent in recent times in light of a continued growth in the gap between humanitarian needs and resources. For example, humanitarian financing to the food sector has increased over the last three years from 6.2 to 7.8 billion USD, while still falling well short of the total requirements. The limitations of the current way of working in relation to such trends is clear: assistance to crises cannot be endlessly scaled up without efforts to address their root causes in combination with managing shocks differently. In most cases, shocks to food systems and food security are predictable - advances in food security analysis tools (e.g., the IPC) and early warning must be used to act ahead of time and curb the impact of hazards on vulnerable livelihoods. At the same time, anticipating crises to food systems to build their resilience is a goal and a responsibility which goes beyond the humanitarian sector and requires a united short- and long-term vision bringing together humanitarian, development, climate sectors and peace actors in partnership with governments, civil society and affected communities.
WHY WILL IT WORK?	The main challenge this thematic coalition seeks to address is bringing together different EW systems at all levels, to build upon sector-specific systems to develop multi-risk EW systems with actionable alerts across and within agriculture and food related sectors. Innovative multi-hazard risk monitoring and forecasting systems currently being implemented in different countries bring together elements of risk prioritization, risk/vulnerability analysis, EW systems and early action, as recently showcased in the Second Multi-Hazard Early Warning Conference (MHEWC-II) hosted by the WMO in 2019. Advanced multi-risk early warning systems exist for climate risks, such as the Climate Risk and Early Warning Systems (CREWS) initiative. While multi-hazard risk monitoring systems are key to informing investments and decision-making at all levels to mitigate the impacts of extreme weather events and climate variability, often monitoring systems are hazard-specific, leading to a fragmentation of data, analysis, alerts, and response. Moreover, challenges remain in linking extreme weather events forecasting for agriculture and food systems with other such as markets, animal and plant pests and diseases, conflict, food prices. This lack of triangulation often results in a failure

	to provide a stronger signal about a potential crisis/disastrous impacts. Taking a multi-risk approach is therefore essential to strengthening understanding of the overall risk context and to inform the development of policies and programmes that contribute to enhancing the resilience of agriculture, food security and nutrition. Multi-risk EW systems should be (i) multi-sectoral (including crop, livestock, forestry, fisheries/aquaculture, and relevant food value chain sectors, including environment and health); (ii) multi-risk (including elements related to climate, markets, conflict, food chain crises); and (iii) context specific to inform decision makers and agriculture and food actors on the necessary actions to be implemented. Ownership at all levels, from national to local, is key to ensure long term sustainability of EW systems and processes, with greater coherence across sectors and the required capacities in place across levels, allowing them to reach the most vulnerable population with context and sector relevant actionable alerts and anticipatory actions, in order to "leave no one behind". On anticipatory action, a growing body of evidence shows that acting before a hazard occurs allows better-value mitigating effects on the event's impact on lives, livelihoods, food security and nutrition, while at the same time strengthening the resilience of vulnerable communities and food systems to future shocks, and lowering the costs of humanitarian responses. Anticipatory action saves lives and livelihoods. In Peru, for example, AA efforts led to a reduction in deaths from 9,300 during the El Niño episodes of 1982/83 and 1997/98 to 20 during the 2015/16 El Niño. In Mongolia, the value of avoided disaster impacts at household level was found to be up to 7 times larger than upfront investments in livelihood protection AAs. The World Bank estimates that the potential benefits from upgrading early warning and early action capacity in all developing countries include an average of 23,000 saved lives per year; and between US$300 million and $2 billion per year of avoided asset losses due to disasters and crisis. *Anticipatory action protects food security*. Anticipatory actions help reduce the impact of forecast hazards on the food security of the most vulnerable affected people. In Southern Madagascar, for instance, the distribution of vegetable seeds, water pumps and micro-irrigation kits ahead of the 2017/18 drought played a key role in ensuring access of vulnerable households to an acceptable and more diversified diet. *Anticipatory action contributes to resilience.* In Colombia, for instance, families who received support ahead of drought and mass migration in 2018-19, scored better resilience capacity than non-beneficiaries. In Bangladesh, beneficiaries felt more confident about their possibility to replant crops and withstand future floods. *Anticipatory action saves costs.* By preventing or mitigating the impact of hazards, anticipatory actions can contribute to avoid or reduce the cost of emergency response. In Bangladesh, for instance, more people were reached with assistance at half the cost through a CERF funded anticipatory intervention ahead of floods in 2020.
HOW WILL IT WORK?	The thematic coalition idea stems from two proposed Game-Changing solutions named as *multi-risk early warning systems with actionable alerts across and within agriculture and food related sectors*, one from USA and the other from UK (see below). These solutions can build on the existing experiences of several partners, including the ongoing CREWS initiative, and be linked to the IPC and Anticipatory Action proposed thematic coalitions from this cluster. Anticipatory action is an increasingly important global agenda with several key initiatives and partnerships working in parallel towards the scale up of this approach at global, regional, and country levels. This includes the G7 Compact on Famine Prevention, the Risk-informed Early Action Partnership (REAP)

	working on government and partner commitments towards scaling up AA in particular in the lead up and at COP26, the Crisis Lookout Coalition, the Anticipatory Action Task Force of key implementing agencies (FAO, WFP, OCHA, IFRC, START), OCHA led Inter Agency Anticipatory Action Pilots and the Anticipation Hub.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	23	**Anticipatory action to protect food systems**. Pre-agreed finance and early action plans will be put in place for all predictable shocks to food systems by 2030. Just two per cent of the funds committed to the COVID-19 response were pre-allocated. This solution would protect the food security and livelihoods of smallholder farmers, pastoralists, traders, and all those who are employed in or depend upon at-risk value chains by strengthening the resilience of food systems to shocks. It is meant for all shocks, from natural hazards such as droughts and floods to epidemics, including in conflict (UK)
	24	**Smallholder Early Warning network to help protect against One Health threats** (SHEW- Net): crowd sourced data for context specific early warning and risk forecasts to prevent high impact crop, livestock and fish pests and diseases. Engaging livestock, aquaculture, crop, and other smallholders directly in community-driven and nationally supported networks built around approachable, digital tools and contextually appropriate communication channels to provide information on best practices and comprehensive biosecurity (vaccination, hygiene, resistant cultivars/breeds etc.) (FAO)
	25	Mainstreaming Anticipatory Actions and government capacities to reduce, mitigate & manage risks (EU)
	26	Early Warning Systems linked to contingency planning and response. Strengthen government capacity, at all levels (national, regional, and local), to proactively reduce, mitigate and manage risks and strengthen systems and policies to reduce humanitarian needs and socio-economic losses (USA)

6. SYSTEMIC MULTI-RISK AND CRISIS GOVERNANCE, INCLUDING RISK INFORMED FINANCE & INVESTMENTS/INSURANCE

THEORY OF CHANGE	Global food systems will need to operate more efficiently and sustainably to feed a growing population, achieve the Sustainable Development Goals and meet the 1.5°C climate commitments of the Paris Agreement. In the meantime, the intensifying impacts of disasters, shocks, crises, and climate change are amongst the key interrelated drivers behind food insecurity and food system failures. The challenge is to manage the interconnected and multiple risks and crises, from production to consumption, in order to build the resilience of food systems, so they better sustain dealing with uncertainty. Systemic risk and crisis management requires scaling-up investment and innovative financing solutions. A suite of complementary actions is proposed, including risk-informed policymaking and finance practices that build resilience and enable effective crisis management across and within food systems to better prepare for and manage disasters and crises when they occur.
WHAT IS THE IDEA ABOUT?	Risks to food systems are systemic with many of the root causes of vulnerability found in unsustainable development practices. To succeed in building long-term resilience, it is critical that governance processes related to risk reduction and crisis management transform to become evidence-based, equitable, multi-sectoral and multi-layered, reaching community levels. As disasters, shocks and crises affect food systems, governments, agri-food companies, and public and private investors need to better identify and address the numerous, systemic, and interconnected risks they face. Targeted investments into resilient food systems, however, are not yet at scale. It is fundamental that enabling conditions and incentives are in place to catalyze investments and blended finance solutions from a large array of investors (agri-food companies, foundations, public development banks, international financial institutions, impact investors etc.). This transformation must be accompanied by innovative financing mechanisms and tools that allow for increased and more effective investment in ex-ante measures to reduce risks to food systems. Such measures should include integrated approaches including regulatory frameworks that provide sufficient financial capacity to absorb disaster risks, while also enabling the use of risk transfer to national and international (re) insurance and capital markets. Finance for risk management should be built on a comprehensive risk assessment to enable risk-informed public and private investment to build resilience where it is needed most. Furthermore, it is important to diversify sources of financing (public, private, blended) and tailor instruments (grants, loans, guarantees, insurance, etc.). These should be specifically channeled to equip small-scale producers and their communities with the resources they need to put in place their own locally adapted resilience strategies against disaster risk, climate variability, environmental pressures, food insecurity and hunger. In particular, blended finance – the strategic use of public and philanthropic capital – can play an essential role to develop a more diversified pipeline of bankable projects and catalyze private investments into resilience and risk-proof food systems. In addition, multi-sectoral perspectives are crucial to transform policies and scale-up financing solutions to be more attuned to the interconnected outcomes of their actions. Innovation and integration of approaches across sectors can ensure that governance and finance are aligned in reducing risk and managing crises effectively. To truly shift the needle, however, government support is needed to fundamentally embed the external costs of unsustainable and vulnerable food

	systems into business-as-usual decision-making, create market incentives for new sustainability and risk management opportunities, and support market-building interventions. Government action through regulation, taxation, fiscal incentives, and public subsidy reform can accelerate the transition from business-as-usual to climate-conscious business and finance at a systemic level in the medium- to long-term. To succeed in building long-term resilience, it is critical that governance processes and the policies related to risk reduction and crisis management transform to become risk-informed, evidence-based, equitable, multi-sectoral and multi-layered catering to the most vulnerable communities.
WHY IS IT NEEDED?	In most contexts, governance interventions to protect food systems are constrained to specific sectors or specific jurisdictions. In parallel, risk reduction interventions are often thought of in terms of hazard protection and response (new rescue vehicles, river-level warning systems). In both cases, the opportunities to apply suites of policies or portfolios of governance levers to intervene at multiple scales and sectors for the mutually reinforcing benefit of the resilience of these systems is lost. Financing for development is often not risk-informed or if it is, it is largely focused on ensuring the viability of the financed programmes in particular climate scenarios. By contrast, it should ensure not only that financing is sustainable and risk-informed, but also that measures to build sustainability, risk reduction and resilience are sufficiently financed. Clear evidence of risks alone is enough to transform the way the levers of governance or finance are applied. In the context of heightened uncertainty about donor funding and debt distress in Low- and Middle-Income Countries, the private sector plays a key role to ensure effective resource allocation and mobilization to combat the negative effects of disasters, shocks, and crises, while supporting economic recovery post-crisis.
WHY WILL IT WORK?	At the core of the proposed approach is to tap into a set of existing tools and strategies to unlock private sector financing from food and agricultural companies, domestic and international financial institutions/banks, and specialized financial investors to strengthen the resilience of food systems in a context of systemic risk. Leveraging blended and innovative financial services and improving risk-informed policy making is vital for building resilience of food systems. There is encouraging evidence that many of these strategies can work and are already working in targeted interventions around the world. Notwithstanding, such a strategy should not be regarded as panacea, but rather as a holistic set of recommendations that need to work in tandem. These should be progressively scaled up based on best practices in order to lead to transformative change over the next decades. Furthermore, political will is fundamental to take the necessary steps to ensure that public good is at the heart of governance and finance decisions; principles of good governance and recent developments in financial disclosure, principles for sustainable investing, international disclosure mandates and others in guiding sustainable risk finance. The challenge is to connect an evidence base to that political will through clear, accountable processes.

HOW WILL IT WORK?	The approach will work through the following channels: 1. Strengthening leadership at multiple levels (regional, national, local) that generates resilience: scaling-up holistic, integrated, and multi-sectoral governance approaches that break down silos, leading to evidence-based and risk-informed decision making across sectors and systems. Greater focus on risk-proofing management of infrastructure, human resources, and operations; involvement of civil society, the private sector and community structures while also emphasizing inclusive, rights-based engagement in all aspects of governance. 2. Creating investment opportunities in the transformation of food systems: raising the bar for risk-resilience on existing business-as-usual investments and continue mainstreaming resilience, environmental, social, and governance commitments to new green investments. Accurately assessing risk and deploying appropriate risk-mitigating mechanisms; decision-makers and finance actors should apply a risk lens with a view to building innovative, cross-sectoral approaches to their policies and programmes in processes – either by avoiding imminent shock or in the process of managing existing crises. Matching the solution to the respective risk-return profiles of different sources of private capital

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	27	Strengthen government capacity, at all levels to proactively reduce, to understand, mitigate and manage risks and strengthen policies to reduce humanitarian needs and socio-economic losses (USA)
	28	Increase access to finance, particularly for smallholders and women, with risk-management tools (USA)
	29	Expand shock responsive social protection programs: food and nutrition assistance and livelihood programmes in food crises (USA)
	30	Multi-hazard, multi-sectoral disaster risk reduction mechanisms at national and local level (Japan)
	31	Systemic approaches to risk analysis including tools (national risk inventory systems to systematically monitor losses and assess threats), anticipatory mechanisms, shock-responsive safety nets, insurance, and micro-borrowing mechanisms (UNDRR).

7. VULNERABILITY AND RISK REDUCTION MEASURES AT FIELD LEVEL

THEORY OF CHANGE	If we manage interconnected and multiple risks and crises, from production to consumption, then we can build the resilience of agri-food systems, so they transform from being part of the problem to becoming part of the solution, and can better sustain dealing with uncertainty. Systemic risk and crisis management requires investing at scale in a suite of mutually complementary actions or interventions, including vulnerability, risk reduction and diversification measures.
WHAT IS THE IDEA ABOUT?	Food biodiversity, also called agricultural biodiversity or agrobiodiversity, refers to the variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry, and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fiber, fuel, and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil micro-organisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest, and aquatic) as well as the diversity of the agro-ecosystems. These plants and animals, together with the associated knowledge, are the foundation of nutrition and livelihoods for families, communities, and societies around the world. Globally, there are about 7,000 domesticated crops. But, today, just four crops –rice, wheat, soybean, and maize– account for two-thirds of the consumed calories worldwide. These crops are nutrient-hungry and – added to the common practice of mono-cropping – they have led to the degradation of a third of the Earth's soil. It is estimated that the global population in 2050 will increase to 10 billion; without considering food loss and waste nor diet changes, food production will have to increase by 50 percent to avoid mass hunger. Previously ignored crops, aptly nicknamed "orphan crops," are part of the answer to preventing the oncoming food crisis, while also tackling global climate, biodiversity, pollution, and health crises. The interconnected systems approach promoted in this thematic coalition idea calls for a systemic approach to tackle these interrelated challenges through: • Investments in underrated and under-recognized 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 reduce multiple disaster risks, are less polluting, and require fewer agricultural inputs in the face of climate change and nature loss. This includes a wide range of resilience good practices, from increasing smallholder access to pest and drought resistant crop varieties[14], as well as funding the work of gene banks and long-term conservation facilities of agrobiodiversity. • Creating incentive schemes to engage a wider audience in the endeavor to safeguard agrobiodiversity for resilience through sustained diversification of our food systems. This includes financial support to outreach and communication activities, and investment in mainstreaming new food sources which are nature positive, climate friendly and resilient within the food basket.

[14] FAO 2019. *Disaster risk reduction at farm level: Multiple benefits, no regrets*. Rome.

WHY IS IT NEEDED?	Disaster risk reduction (DRR) and climate change adaptation (CCA) or resilient good practices and technologies at farm and firm levels can help to reduce the underlying risks to food and nutrition security as well as may increase or stabilize yields/production, enhance diversification, and decrease vulnerability against production failure due to the impact of disasters and climate extremes and variability. Furthermore, some good practices also bring climate adaptation co-benefits and various ecosystem services. Agrobiodiversity improves the resilience and sustainability of the agri-food system. The loss of local varieties and breeds of domesticated animals is a serious threat to global food security because it undermines the resilience of agricultural systems. Without this diversity, we cannot expect the food systems we depend on, to be able to absorb and adapt to new onslaughts of pests and pathogens, and to the suite of climate extreme and slow onset events with altered growing conditions, that climate change will bring.
WHY WILL IT WORK?	Recognizing and promoting under-rated, locally adapted agricultural varieties 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 and stresses. "Future foods" such as microalgae, mycoprotein and mealworm have been suggested as nutritious and sustainable dietary options[15]. 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 leaves a lasting impact in the way our food systems operate in the future. Diversification of the food basket has the potential for impact at scale, it is actionable if investments are provided, and is the resilient and sustainable way to ensure that we can feed the growing population. Furthermore, it has demonstrated positive effects on ensuring equitable livelihood opportunities, advancing human health, and regenerating environmental integrity, with a focus on women, youth, and marginalized communities.
HOW WILL IT WORK?	Proposed Game-Changing solutions which are at the core of the thematic coalition on *Vulnerability and risk reduction measures, including livelihoods and nutrition diversification,* are*:* • Long-term conservation of food diversity in gene banks and in the field, and sustained diversification of the food basket. • Increase smallholder access, with a particular focus on female smallholders, to pest and drought resistant crop varieties, better water and soil management practices, and other technologies This thematic coalition idea will grow in making linkages with other FSS AT and clusters solutions.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	32	Long-term conservation of food diversity in gene banks and in the field, and sustained diversification of the food basket. (SoAR, Croptrust, ICBA)
	33	Increase smallholder access, with a particular focus on female smallholders, to pest and drought resistant crop varieties, better water and soil management practices, and other technologies (USA).

[15] Tzachor, A., Richards, C.E., Holt L. 2021. Future foods for risk-resilient diets. *Nature Food.* doi: 10.1038/s43016-021-00269-x

2.1 ENHANCE LOCAL PRODUCTION FOR LOCAL CONSUMPTION

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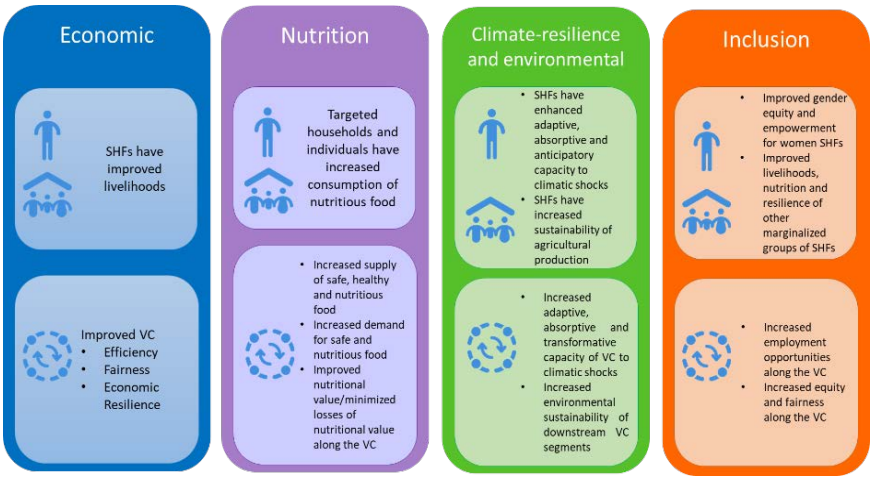
8. LOCAL FOOD SYSTEMS FOR LOCAL PRODUCTION

WHAT IS THE IDEA ABOUT?	This thematic coalition aims at improving food system resilience by promoting both the offer and demand of local products, leading to the reinforcement of local food systems. Without prejudice to the positive impacts that trade can have on food resilience, shorter food chains offer advantages in terms of producer empowerment, food independence, resilience to shocks, food diversification, income generation or environmental sustainability. For this, a variety of measures is proposed. On the offer side, these include the development of complementary, nutritious food sources, or urban farming. On the demand side, it leverages the power of public procurement from governments and international organisations. Some specific initiatives are also proposed that tackle both offer and demand.
WHY IS IT NEEDED?	**In developing countries**, the COVID-19 pandemic has shown that over-dependence on external markets can be a threat for food security and appropriate nutrition. Small food producers and the poor –including the urban poor- have been particularly affected, as they are especially vulnerable to food shocks and malnutrition. Small food producers are increasingly dependent on markets and are exposed to food system disruptions. They are also exposed to seasonality, climate change, etc. Urban poor rely on markets for their food supply, which often depend on imports. Both have low income and rely mainly on staple foods, with limited consumption of fresh, nutritious products. **In developed countries**, local food production and consumption can be an incentive to adopt more sustainable productive practices, promote a more equitable share of the value added, raise consumers awareness on sustainable diets, and generally to increase mutual trust between actors in the food system. **Globally**, food systems account roughly for one third of the local GHG emissions. A sizeable part of these is due to the increasing volume of food that is traded internationally.
WHY WILL IT WORK?	The combination of offer and demand oriented measures will avoid bottlenecks and stimulate the creation, consolidation, and growth of local markets. The development of local food chains will reduce the impact of trade disruptions and natural catastrophes on food security, creating "food buffers". It will also generate jobs and income, and increase the offer and consumption of fresh produce. It will also achieve a more balanced distribution of value and improve trust between actors throughout the value chain. The consolidation of shorter value chains will significantly reduce GHG emission associated with long-distance food trade. Figure below illustrates how the measures proposed can help achieving many objectives at individual and system level:



HOW WILL IT WORK?	The thematic coalition proposes a mix of complementary, highly synergetic measures to promote local supply and demand of nutritious food. • Promoting the production of nutritious food complementing staple food production, through backyard poultry, kitchen gardens, etc. This aims both at self-consumption and small, local trade, helping diversify diets and increase income. Putting this initiative in practice requires policy support, generation and exchange of knowledge, or the creation of an enabling environment (local wet markets, producer associations, extension services, etc.) • Promoting urban agriculture. This can help the urban poor become more resilient by diversifying food sources, improving access to nutritious food, reducing dependency on imports, and creating food buffers in times of crisis. Putting this initiative in practice requires policy measures (e.g. integration of urban agriculture in food policies, urban planning and disaster risk plans), development of local markets and short food chains, mainstreaming of local public procurement, development of extension services, appropriate financial mechanisms, etc. • Strengthening the base of national food production and enhancing food self-sufficiency, through government-led programmes and investments. This is particularly relevant for countries highly dependent on imports that need to increase national production. **In developed countries**, the thematic coalition proposes two integrated initiatives to promote small-scale local food systems with more diversity, alternative farming models and strong links with the territory, while developing direct relationship between food system actors, from producers to consumers: • Promoting the installation of small, local livestock processing facilities connected to local farmers, providing food to local markets and communities. This initiative aims at generating a dependable food supply, create local jobs, reduce risks, fulfil consumer expectations on freshness and quality, and contribute to climate change mitigation. It would require government support. • Developing regionalized food systems that mobilize local production for internal consumption. The aims are to reduce regional disparity and external dependence, increase resilience of local food systems and better connect the actors in the food chain. This measure requires the private sector to mobilize in support of positive innovation and consumer education to stimulate demand. Each region needs to develop its own strategy and approach – no single solution can be proposed.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	34	Nutritional resilience and production for self-consumption of rural communities with backyard poultry, home gardens & farmers' and community markets. Increasing autonomy over consumption and an enhanced sense of dignity and self-respect, with indigenous crops, which are often more nutritious and resilient (biodiversity and dietary diversity). (Farmers' Forum, India, www.bks.org.in)
	35	Climate-resilient urban agriculture for villages and small towns by shortening the production and consumption spaces and supply chains. Integrating urban food systems into green infrastructure, urban planning. Integration of urban agriculture into food policies and urban planning with land-use and zoning policies, waste management programmes, transportation projects and food safety norms. (UNEP, RUAF, Rikolto)
	36	Strengthening the base of national food production and enhancing food self-sufficiency (Republic of Korea).
	37	Local production for local consumption in USA: local livestock processing facilities connected to local farmers and provide food to local markets and communities (Minnesota Farmers Union).
	38	Local food systems for local consumption, regional food supply zone through rural farming and fishing villages (Japan, France)

9. PUBLIC PROCUREMENT

WHAT IS THE IDEA ABOUT?	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. In recent years, local /regional procurement is gaining recognition as a preferable modality for food purchase in humanitarian assistance. Many donors and implementing organisations are developing policies and guidelines to favour this approach and make it the default choice for in-kind assistance whenever possible. However, international procurement is still widely used, due to institutional inertia, the perceived difficulties and risks of local purchase, and donor interests. 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. A political commitment to make local/regional procurement the general rule for in-kind food assistance by 2030 would accelerate the transition. Such commitment should be complemented by an implementation roadmap with clear milestones and targets (in terms of e.g. percentages or amounts) to which the signatories would subscribe. This roadmap should consider the promotion of good practices throughout the food chain, to ensure sustainability, fairness, equal opportunities, etc. Specific guidelines should be developed for this purpose. Finally, the roadmap should foresee communication activities, evidence-gathering and a monitoring framework for the action.
WHY IS IT NEEDED?	Humanitarian food assistance intervenes when food systems fail, saving lives and protecting livelihoods. In this way, it helps food systems cope with and recover from shocks, and thus constitutes a key element of food systems' resilience. Most humanitarian food assistance is still provided in-kind, and international procurement has been the traditional means to purchase food under this modality. However, the distribution of large amounts of imported food often produces disruptive effects on local food systems with, in the longer term, negative effects on food resilience. Resorting to international

	procurement is, moreover, a missed opportunity to boost local food systems, working along the humanitarian-development nexus. 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.
WHY WILL IT WORK?	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 WILL IT WORK?	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).

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.

By promoting access to fair and transparent markets for smallholders and MSMEs, the contribution of this solution for building sustainable food systems is manifold:

- Value chain efficiency and effectiveness, reducing transaction costs and market imbalances
- Nutrition-sensitive value chains for the availability, access to nutritious foods for consumers
- Climate-resilient value chains, value chain actors can absorb and adapt to climate-related shocks and promote sustainable production systems
- Inclusive value chains; supporting the most vulnerable (including the resource poor, women, youth, people with disabilities, indigenous peoples)

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	39	Local and regional 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) (WFP, EU)

10. INCREASING WOMEN'S AGENCY FOR RESILIENCE THROUGH ECONOMIC EMPOWERMENT

WHAT IS THE IDEA ABOUT?	Empowering and increasing women's agency will contribute to building the social, economic, and environmental resilience of Local Food Systems. A transformative solution for women and girls that helps them build their agency through better access to livelihood opportunities in local food production can also improve universal access to food. Our approach supports building inclusive economies through a transformative-impact financing that focuses on gender responsive service delivery, infrastructure investment, and local economic development. The solution promotes gender and youth responsive economic growth and aims to better distribute economic benefits of agriculture and improved local food systems. The approach complements existing agricultural/SME finance facilities by addressing identified gaps in financial and technical assistance services for value adding agricultural projects promoted by women and youth that contribute to their economic empowerment as well as reducing environmental risks and ecological scarcities along the agriculture value chains. With greater empowerment of women in local decisions, it will be possible to develop more targeted and resilient local investment plans that will address deep rooted discriminatory practices in local food and agriculture systems that currently contribute to insecurity and inequity. The proposed idea promotes women's and youth economic empowerment by developing need-based local solutions with an in-depth assessment of required priorities and support to resilient and sustainable local enterprises. This include conducting gender responsive local economic assessments in targeted localities and providing financial and technical support to women and youth led local solutions that contribute to landscape restoration, sustainable land management and effective natural resource and biodiversity management, and resilience to climate change in targeted areas. By bringing affordable capital and blended finance to local economies through multi-stakeholder partnerships in collaboration with local governments and private sector investments that promote food security and create a sustainable impact on the local environment with active involvement of women ad youth can be prioritized. This requires: • increased investments in local food and agriculture related businesses and SMEs of women and youth • development of tools that will allow systemic integration of gender and youth priorities in local investment decisions related to agriculture and food security • active participation of women in decision making processes including decisions related to local investments, planning and budgets • strengthen local agricultural departments and specially those units responsible for delivering on gender equality and youth empowerment. The aim is to develop sustainable local models of agriculture and land management that promote food security, sustainable land management for local economic development and that empower women and youth and increase their agency for resilience.

WHY IS IT NEEDED?	Women produce more than 50 percent of the food grown worldwide, according to FAO estimates (FAO, 1995a). In sub-Saharan Africa, women contribute 60 to 80 percent of the labor in both food production for household consumption and for sale. Women, often accompanied by their children, play key roles in production and marketing. However, food production in the territory is generally still commanded by men. Women can seldom afford food production assets and thus are not well connected to the food value chains either for staple or cash crops. They are often not involved in the decision-making processes or local food system governance. Women's involvement in food supply chains can increase household income and their decision-making authority but can also increase women's time poverty due to the need to balance unpaid care work. Many women-owned enterprises remain in the informal sector and cannot establish themselves as formal enterprises which constrains their ability to improve or expand their businesses and access capital. The difficulties in access to finance for small scale producers and SMEs to support to local agricultural transformation and local resilience building are well documented. These difficulties are even greater for women who often lack collateral, including ownership of land. Youth also face a huge challenge in limited livelihood opportunities and difficulty in transitioning to gainful employment and enterprise due to the narrowness and lack of diversity of local economies.
WHY WILL IT WORK?	The proposed idea will work as it requires building long term sustainable solutions in collaboration with local partners. Local authorities, for instance have an important function in environmental governance and land-use management. However, they need additional support and technical capacity to develop a gender responsive local economic model that allows them to increase the productivity of the resource base through the rehabilitation, protection and management of landscapes and other land capital and increase local basic services delivery. Our solution proposes a) empowerment of local authorities through direct financing and technical assistance and b) gender responsive financing for SMEs that will help improve food security and nutrition and improve local income of poor and underserved particularly women and youth. This will help generate sustainable local economic growth based on the promotion of businesses and jobs related to resilient food systems and agricultural development and economically empower women and youth. The idea builds on a solid tested model that will implement a comprehensive approach to environmental management and food security, enhancement to national and local resources allocation, promoting public, private and PPP investments to boost gender and youth local economic development.
HOW WILL IT WORK?	The design and implementation of gender responsive funding mechanisms such as guarantee funds can enable access to capital without collateral requirements, and blended finance mechanisms can enable de-risking and provide a customized mix of finance structuring services, and financial products to locally owned gender responsive businesses and support incubation projects that are critical for local food systems. Gender responsive elements can be built into projects and enterprises through specific measures for increasing women's ownership of assets, their decision-making roles, improved employment and flexible work opportunities, safety and security in the work environment, and child care facilities. Similarly for youth, such an approach can provide greater local employment and enterprise opportunities and pathways for economic empowerment and growth by expanding and diversifying opportunities within local food systems and local economies.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	40	**Finance for Food (F4F) programme: Mobilizing finance to strengthen Local Food Systems governance in West and Central Africa** (grants, advisory services and capacity building to local governments) (UNCDF)
	41	Community and individual back-yard gardens utilizing vertical farming tools, local technologies, recycled materials, low-cost drip irrigation or hydroponics (African Farmers' Association)
	42	Blended financing mechanism to small initiatives locally owned by women and youth (UNCDF)
	43	Increase access to finance for smallholders and women, with index-based risk insurance, digital technologies, and blended finance (USA)

11. SECURING ACCESS TO LAND AND RESOURCES

WHAT IS THE IDEA ABOUT?	Address problems related to land access and utilisation, and access to resources, which are sources of poverty and limiting factors for food production. A combination of measures is proposed, including the development of information systems, holistic programmes, or the development of land banking systems.
WHY IS IT NEEDED?	Inequitable distribution and lack of access to land and natural resources are major causes of hunger and poverty. They are also limiting factors for food production, as access and tenure security influence the decisions producers make, their appetite for investment and risk, their options for credit, or the adoption of sustainable farming practices. This is particularly the case for women, who have an increasing role in agriculture but are often disadvantaged by discriminatory customs, laws and procedures. In another vein, abandonment or underutilization of arable agricultural lands correlates with food insecurity and results in economical and potential production loss. Securing access to land and resources should thus be an integral part of any plan aiming and promoting local food production, as it can stimulate productivity, reduce land-related conflicts among local communities, and empower producers – notably women. This cannot be reduced to the provision of tradable property rights – more comprehensive interventions must be envisaged, aiming at increasing the capacity of farmer's organisations and institutions, sound and well targeted pro-poor policies, etc. On the other hand, land abandonment or under/non-utilization of arable agricultural lands correlates with food insecurity and results in economical and potential production loss.
WHY WILL IT WORK?	Improving access to land and resources and securing tenure reduces risks for producers, and hence stimulates investments, productivity, and the adoption of sustainable practices. It also prevents land grabbing and conflict over land and resources, reducing producers' uncertainty and vulnerability. Land banking systems help optimising the management of agricultural land, hence improving the agricultural output. All the above considered, this thematic coalition would help improving food security and the equity and inclusiveness of food systems, chiefly in locations where a clear framework is missing. Experiences and studies from the NGO coalition ANGOC illustrate the importance of access to land and resources in improving food security.
HOW WILL IT WORK?	A few proposals have been put forth to address the issues of access to land and resources: • Developing Community-Based Information Systems on Land Rights and Food Security to help gather the views of rural actors, in order to inform sound plans and policies in a bottom-up approach. This initiative will look into experiences and needs of village-level smallholders and family farmers, and use this information for the preparation of village development plans, policy development, and the establishment of local food hubs. • Generally improving security of land tenure and access to natural resources through appropriate interventions. These should go beyond the mere provision of tradable property rights and be more comprehensive, encompassing sound and well targeted pro-poor policies, increasing the

	capacity of farmer's organisations and institutions, gender-related measures, etc. • Developing and promoting land banking instruments to address the issue of abandonment or underutilization of arable agricultural land, contributing to strengthen local food production.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	44	Improve security of land tenure, land banking and community-based mechanisms on land rights and control over resources (USA, Turkey)
	45	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. Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC)

12. FOOD STORAGE FACILITIES

WHAT IS THE IDEA ABOUT?	An Integrated Approach for Storing Food 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 storing 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.
WHY IS IT NEEDED?	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. Storing facilities are one of the best ways to enhance resilience at household level, as better storing capabilities will enable vulnerable farmers to withstand climate vagrancies and sell the harvest when prices are better or when willing to do it. In households where food for self-consumption represents a great share of total household consumption, storing facilities represent the difference between food security and hunger. 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.
WHY WILL IT WORK?	Agriculture is a high-risk activity. Farmers face uncertainty from weather, the economy, pests and disease outbreak, health and nutrition challenges, etc. Reducing losses is a vital part of building resilience, especially of smallholder farmers. Proper drying and storage after the long battle to harvest, reduces the length and severity of the lean season between harvests and keeps families healthier due to increased availability of adequate, nutritious and safe foods. Reduced losses equate to greater opportunities to sell produce, while also increasing the efficiency of environmental resource use. Smallholder farmers are key to local and regional food systems. Reducing losses would result in greater availability and accessibility for entire communities.
HOW WILL IT WORK?	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 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. 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 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

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	46	Integrated approaches to storing food at national & HH level (mobile grain stores & strategic food reserves). Strategic food reserves to smooth consumption shocks and build resilience in shock-prone areas to stabilize prices, build safety nets for temporary assistance to affected communities, and/or boost national social protection systems. Sustainable strategic food reserves at the different levels (communities, national, regional and international). (WFP & World Farmers' Organisation)
	47	One million grain stores in the IGAD region. Applying technologies to scale, enabling locally driven resilient agri-food systems, with at least 2 500 000 rural men and women possessing enhanced knowledge and skills on PHM and finance literacy (IGAD, WFP).

13. POLICY AND INSTITUTIONAL INNOVATIONS FOR RURAL AREAS

THEORY OF CHANGE	The objective of the solutions proposed is to create **resilient and equitable food systems** fostering improved agricultural production and stabilize trade, increase capacity to respond to shocks, empowerment of vulnerable groups, higher attention to social and environmental sustainability parameters and increased use of data to support decision-making. Overall, the solutions will achieve this by increasing the flow of information, goods, and money/incentives while supporting the market power and agency of vulnerable actors along the supply chain
WHAT IS THE IDEA ABOUT?	The idea is to strengthen each actor and key activities along the supply chain to promote functioning systems while putting the most vulnerable at the center to foster livelihoods, equity, resource stewardship and resilience. This would entail collaboration among stakeholders from across different sectors, which implies involving the whole value chain and increasing the role that farmers' organizations play, will enable building **resilient, equitable and sustainable supply chains** putting farmers at the center of food systems. This means fostering inclusiveness by empowering most vulnerable groups (such as women and young farmers) to ensure no one is left behind; enabling transparency through consistent information flows and increased digitalization of processes; recognizing the multidimensional nature of the farming activity, replacing the old vision of agriculture as a simple "provider of raw material"; promoting biodiversity and an increased attention to the environmental impacts of supply chains; reducing post-harvest losses through improved storage facilities and increased access to credit; etc. This will strengthen the resilience of individuals, households, and communities, translating into social, economic and environmental benefits.
WHY IS IT NEEDED?	The COVID-19 pandemic showcased the **fragility of global food systems** and their **vulnerability to sudden shocks**, compounded by an unprecedented number of crises (related to climate change, environmental disasters, biodiversity loss, conflicts, population displacement/urbanization, etc.), high rates of food loss and waste, resulting in steeply rising levels of food insecurity. Against this backdrop, 2021 sees the global spotlight thrown on the importance of transforming food systems, which must now withstand disruption and shocks in the short term and support the building back better of economies and societies in the medium to long term.
WHY WILL IT WORK?	The diversified impact of the COVID-19 pandemic on economies throughout the world demonstrates there is **no one-size-fits-all approach** for the development of food systems, reinforcing the need to undertake a tailored approach to empowering national supply chains to empower the production, distribution and marketing of nutritious foods within an equitable and resilient system. The impact of the COVID-19 crisis in certain contexts was mitigated by a balance in food systems between different length of value chains and different economic scales of operators involved, who cooperated to ensure the continuity of the food supply chains. Improved production capabilities for farmers combined with adequate knowledge and technologies to mitigate food losses, particularly post-harvest losses – will ensure a diversified offer of local food, which will better match preferences of end-consumers and support diverse diets; generate greater resilience to shocks as a key factor to ensure that local climatic or geo-political events are not exacerbated by hunger; and increase attention to environmental issues and biodiversity. **Support of UN and multilateral agencies**, as well as Governments, will help influencing policy and regulatory framework, with a positive impact for individuals, households, and communities.

HOW WILL IT WORK?	**Collective action** through farmers' organizations and cooperatives will be critical to withstand vulnerabilities, shocks, and stress, reduce production and transaction costs, reduce post-harvest losses, improve quality and market access, and increase the bargaining power of producers, allowing them to ensure sustainable production conditions. Also, increasing vertical cooperation (e.g. between producers, traders, retailers, and consumers) has the potential to mitigate short-term impacts of crises and enhance resilience of the food system, by favoring coordination and planning of production and trade (e.g. promoting best practices, market transparency and lower food waste). **Training of farmers on climate change and biodiversity** topics will help coping with shocks, increasing resilience and adaptation to crises, as well as ensure socially- and environmentally sustainable food production (e.g. transforming empty spaces into new farms, sustainable home gardens). Improving post-harvest loss management, which combined with an inventory credit or warehouse receipt system, can make a marked move towards self-reliance. Particular support will be provided to most **vulnerable groups**, especially women and young farmers, to increase the basis of suppliers at the overall benefit of local economies. Improving trade conditions is a key element of this game-changing initiative, that will contribute to leveling the playing field so that developing and developed countries can equally benefit from trade. Review of national policies and increased harmonization on international food safety standards will help local farmers access external markets, by enabling them to meet other countries' importing requirements. Promoting greater acceptance of electronic documentation (e.g. bills of lading) as well as communication and trading platforms to facilitate trade are expected to help addressing longs-tanding barriers to widespread digitalization of cross-border trade processes. Other digitalization measures to be put in place include improved market intelligence (e.g. through open-source data), collecting, interpreting and using the information received from weather stations, with an emphasis on linking climate and crops to support decision-making on management of agricultural systems. Digitized management of electronic phytosanitary certificates, provided support by implementation partners and local private sector actors, will reduce costs and risks of loss, damage or certification frauds. Also, setting up ICT to enable joint ventures, partnership and institutional design for investments, will contribute to making farmers and farmers cooperatives equal partners with investors. Financial services will be key enablers of increased resilience and adaptation, especially for climate change, for example through access to insurance schemes. Also, improving adequate access to credit (e.g. better rural coverage) will address farmers liquidity constraints – the farmers will have adequate investments in production inputs as well as handling, storage and processing equipment thus improving quality and quantity of their marketable surplus.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	48	**Data driven supply chain system to understand and identify real time shortages between regions** through a live mapping of products, e.g. across factories, retail stores and warehouses to allow collaboration among stakeholders in times of need. Such a mechanism could also be applied to avoid food loss and spoilage, introducing re-allocation efforts in places where there is excess food. The data-based facility tracks capacity in factories and retail stores to anticipate shocks in the supply chain, will allow governments and other stakeholders to identify areas at risk of acute shortage, or areas where there may be risk of spoilage due to excess food. (Tetrapak company)
	49	**Joint partnership and institutional design for Investments in India**. A loan cum investment basis between Dutch investors and Indian farmer groups, by setting up ICT enabled joint venture of agro-processing enterprises based on solid feasibility studies and business plans. Farmers and farmers cooperatives become equal partners with investors http://annamrit.com/story.html (Annamrit Farmers As Owners Foundation, India)
	50	**Open-source urban farming.** Collaborative community of citizens, farmers, scientists, educators, agtech experts, soil impactors, land stewards, energy innovators, hardware makers and software developers who make up a SMART AGHUB network of shared resources. https://skyfarms.io/test/build/
	51	**Market Approaches to Resilience in Ethiopia**: addressing multiple drivers of vulnerability simultaneously, so to increase communities' resilience (Farm Africa).
	52	**Farmers' cooperative business model in Korea:** cooperative supermarket stores and vertical integration from farm to retail. 1118 member cooperatives and 2.3-million-member farmers (Korean Agricultural Cooperatives, NACF).
	53	**Farmers' Organisations role to improve farmers' resilience and livelihoods in Kenya:** home gardens, Farmers' Field Schools, cooperatives (Kenya National Farmers' Federation).
	54	**Integrated Design for Equitable Agricultural Systems using Artificial Intelligence.** AI-powered 'healthcare' system for honeybees, animal/livestock, and food crops (fruits and vegetables). Smart Supply Chain and Smart Consumption (North Carolina A&T State University).
	55	**Resilient Food Value Chains,** cooperation horizontally and vertically, rural revitalisation through thriving businesses, digitalization of food systems in rural areas **(USA, China)**
	56	**Virtual World Marketing Centre,** contract agriculture for fresh fruits & vegetables **(Turkey)**
	57	**Agri business tech (**World Farmers' Organization)

14. PANDEMIC-RESILIENT FOOD SYSTEMS

WHAT IS THE IDEA ABOUT?	Based on the COVID experience, as a highly-disruptive shock that has affected food systems all over the world, this coalition will deal with a four-pronged compact with policy interventions that have proven to enhance resilience of food systems: a) safety nets, b) schools as hubs to secure food to children, c) civic collective actions for food based on cooperation, solidarity, mutual aid and caring for others, and d) public policies that guarantee agri-food trade flows. This coalition will be dealing with those solutions that, combined, enable food systems to cope, absorb and respond to external shocks while maintaining one of its basic features, namely feeding people adequately and guaranteeing that they are free from hunger. Actually, those four elements would be essential pillars of the Universal Food Access scheme that, mirroring those already in place in many countries for health and education, would secure that everyone gets access to enough and adequate food to get a healthy diet, either by market mechanisms, public provision or civic collective actions for food.
WHY IS IT NEEDED?	The global shock of the COVID-19 pandemic has highlighted the need for resilient and efficient food production and supply chains. The current industrial food system is not fit for purpose as it doesn't serve the farmers adequately, specially peasant farmers, smallholders, pastoralists and fisherfolks; it doesn't respond to the needs of poor people who are hungry and at risk of malnutrition, particularly women and children. And they are also far too long and too easily disrupted because it is more articulated around bottlenecks, market concentration and oligopolies. COVID-19 has demonstrated three key lessons: i) the fragility of market mechanisms to fully cover the food security needs of the most vulnerable households and the importance of public and civic-informal networks; ii) the critical importance of addressing persistent inequalities, as vulnerable populations were disproportionately affected by COVID-19 and its associated economic recession, specially casual workers, urban dwellers and women, children and elders, and iii) as a zoonotic disease, COVID-19 has highlighted the negative impact that failing to correct our relationship with nature will have on global sustainable development efforts. Returning to business as usual is not an option. In a world of persistent inequalities there have been calls from various international and multilateral bodies, including the UNSG and the OECD, to 'build back better' via a sustainable, resilient and inclusive recovery with a strong focus on resilient food systems, resilient health systems and well established social protection systems. Moreover, two key public institutions have emerged as vital in securing access to food and other vital needs to the most vulnerable, namely (a) schools to secure meals to children and (b) cash, voucher or food-based safety nets to secure vital income to those who lost income sources, employment or incurred in health-related expenses.
WHY WILL IT WORK?	This set of political interventions to render food systems more resilient to the next disruptive event are based on cumulative evidence of its impact, feasibility and cost-effectiveness. Actually, the relevance of the four pillars of this coalition to cope, withstand and recover from the COVID impacts has been proven in many countries. Actually, home grown school feeding programmes have been the mainstay of many poor families all over the world, thanks to a

	combination of public funds and humanitarian assistance provided by institutions (i.e. WFP). The same case applies to different types of safety nets (food-based, cash-based on voucher-based), that have become the most relevant public instrument States have applied to buffer the economic impacts of COVID19 lockdown restrictions (see World Bank database, coordinated by Ugo Gentilini). In both cases, once those instruments of public policy have proven its efficacy to secure access to food to the most vulnerable, the key challenge for them to become game-changers is to scale them up to become universal. As they are cost-effective and they can guarantee the right to food, they should be upscaled massively and progressively, so as to cover the whole population of any given country, because we all need to eat to survive and because it can be done (in similar terms that universal health coverage and education for all are political objectives signed off by most countries in the world). In addition to public provision and market mechanisms, self-organised collective actions by citizens shall be encouraged (neighbourhood networks, community supported agriculture, mutual aid networks, etc). Those informal networks have mushroomed all over the world in villages, communities and neighbourhoods, from the US to Philippines, from Russia to South Africa.
HOW WILL IT WORK?	By universalizing two of the most successful, tested and morally accepted public policies, safety nets and school feeding, this coalition seeks to elevate the political ambition of the fight against hunger, the guarantee of the right to food and the resilience of national food systems to external shocks. By extending gradually (in a decade-long initiative) the coverage of school feeding programmes (accompanied by nutritional and agricultural education, specially in rural areas) and the different modalities of safety nets to cover as many vulnerable people as possible, national food systems could be reinforced to cope with a possible next shock (either another pandemic, a protracted drought or an economic crises), securing a minimum vital access to food to vulnerable groups and sectors. Moreover, by using schools as hubs of development (improving facilities, public works, school gardens, public procurement with local producers to supply school canteens that cook school meals with local, seasonal and agroecological products), those institutions of the public sector (that are relevant for education, health and food) may become nodes of resilience and development, articulating production and consumption in short circuits. Actually, using a logic different from the market one, the Ubuntu rationality or the care for community well-being as part of my own well-being, we can focus all our efforts is securing that everybody gets access to food in times of distress, by public, market or civic not-for-profit means and solidarity networks, instead of just securing market mechanisms. In any case, it is important that market mechanisms are also pandemic-proof, and the experience acquired these two years will serve to prepare better contingency plans for another pandemic-related shock in the years to come.

INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	58	A safety net with a minimum income for the COVID-19 affected populations in situation of vulnerability to guarantee access to food (Brazil).
	59	**Building back resilient food systems in Africa: the Ubuntu pathway.** The main action is promotion of innovative, agroecological, local food production for local use in African Cities, and food rescue and redistribution to promote universal food access and equity, in line with UBUNTU, to strengthen food systems' resilience and COVID19 recovery. This solution builds on the EU funded Horizon 2020 Healthy Food Africa Project (African Population and Health Research Centre).
	60	"Learning by doing" scheme exposing schooled children to farming activities in Finland: specific learning spaces (business villages called Yrityskylä) (Federation of Agricultural and Forestry Producers, MTK & Valio, dairy company).
	61	Platform integrating IoT (Internet of Things) and Artificial Intelligence for tracking nutrition and health for millions of school children receiving school feeding programmes for real time monitoring of quantity, quality and tracking BMI on a daily basis (UdyogYantra, Private Indian Company)
	62	School-based agricultural education: youth-centered agriculture, combining academic, vocational and life skills development of rural youth, and using classroom instruction, school demonstration farm, home entrepreneurship projects and leadership development.
	63	International coordination & contingency arrangements to ensure continuity of agri-food trade flows (Regional Partnerships, avoid disruptions in global markets) (EU, China, Japan)

2.4 ETHICAL DEVELOPMENT PATHWAYS

CO-LEADS:

- TBD

15. ETHICAL DEVELOPMENT PATHWAYS

THEORY OF CHANGE	Ethical frameworks of consumption, production and waste shifts away from the extractive and exploitative relationships with food, people and planet within, providing an alternative narrative ensuring that the most vulnerable have access to food, health, social protection, livelihoods, economic stability and peace.
WHAT IS THE IDEA ABOUT?	Recognizing the need for a whole of society approach to address an equitable and just transition towards resilient food systems, and the critical role that behavior change plays in this process, this Cluster *includes aspirational and inspirational solutions to provide narratives based on ethical development pathways for Resilient Food Systems and a Just recovery.* Cultural and behavioral change must accompany the transformation of our food systems to ensure that resilience is at the heart of all our interventions, therefore, this interfaith coalition will play a critical role in inspiring the behavioral and culture change needed for a just and equitable Pandemic recovery and a future in which we leave no one behind.
WHY IS IT NEEDED?	The existing interfaith coalition consists of religious institutions that are already inline with the narrative of multilateralism and coexistence in the interest of creating a more sustainable future. The new approach is to engage faith groups that are against these notions and to create a greater mutual understanding of the gaps and needs of these communities and create inclusive and transformative strategies that allow for a shift in narrative. *This is the only proposal to the UNFSS for a Coalition of Faith Based Leaders as a Game Changing Solution for more resilient and ethical food systems.
WHY WILL IT WORK?	Faith communities work in the most marginalized communities around the world. By coalescing faith leaders' wisdom and insights, while sharing frameworks for ethical consumption and production of food, local faith leaders can gain insights into sustainable interventions that ensure vulnerable communities' food security and resilience to economic instability. These solutions are meant for faith communities around the world to integrate into their unique contexts.
HOW WILL IT WORK?	Providing interfaith leaders with common ethical frameworks that blend religious wisdom with scientific data, we can shift the narrative on our consumption and production patterns, through religious influence, to emphasize gender equality, our intrinsic human rights, and the rights of all sentient beings, and empower local communities to reexamine their relationship with food, creating space for faith and ethical inspired actions to emerge that strengthen resilience, food security, and food sovereignty. Solutions related to Ethical Development Pathways include: 1. Change of Narratives around food, as a human right, a common good, as a medicine or a sacred good (e.g. Indigenous Groups). 2. Reflecting on how to shift away from the extractive and exploitative models we currently have with both people and planet, applying a moral and ethical dimension to the act of consumption and production of food, waste reduction and resilient development (e.g. investing on innovative

		recycling initiatives such as the transformation of food packaging/plastic into items to support humanitarian aid, medical use or disaster recovery). 3. Highlighting religious teachings from major faith traditions that align with the universal human right to food and sustainable relationships with food and how this is applied in practice in hospitals, schools, Humanitarian assistance, disaster recovery. 4. Spotlighting key innovative faith based actions that can be adopted widely in diverse communities of faith that build Pandemic Resilient Food Systems (e.g. the Buddist compassionate quarantine) or Climate resilient food systems.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	64	**Inclusive and ethical development pathways for resilient food systems.** Establishing an Interfaith Coalition to Change narratives around food (common good, human right, medicine or sacred good). Applying a moral and ethical dimension to the acts of consumption, production and waste zero. Highlighting religious teachings from major faith groups that align with the universal human right to food and how this is applied in practice in hospitals, schools, shelters, refugee camps, humanitarian assistance/response or as key element of the compassionate Covid19 quarantine (Buddhist Tzu Chi Foundation & Interfaith Coalition).
	65	**Ensuring life cycle-tailored food for all people,** regardless of their income. Providing food-related support needed by consumers, such as children, pregnant women and multicultural families (Republic of Korea).
	66	**Health in Harmony: Planetary health approach** to human and ecosystem wellbeing in Manombo, Madagascar. Community-based, Indigenous food systems, forest management, alternative narratives (Health in Harmony).
	67	**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.

16. INNOVATION ON CLIMATE ADAPTATION

WHAT IS THE IDEA ABOUT?	This theme brings together innovative solutions in climate change adaptation that focus on empowering vulnerable groups such as smallholder farmers, small and medium enterprises, women and youth, thus making them more resilient to climate and other shocks. First, the solutions address key dimensions of the food system, including securing tenure rights, land banking and sustainable land management. Furthermore, this cluster covers finance for sustainable food systems. In this regard, innovative solutions include improving access to finance; enhancing financial literacy; expanding low-interest loan opportunities; encouraging private and public investments.
WHY IS IT NEEDED?	a. Land abandonment or un-utilization of arable agricultural lands is deeply correlated with food security and results in economical and potential production loss. b. Small farmers have difficulty in accessing necessary finance mechanisms as small or shared lands are not accepted as collateral by banks; there are some failures or delays in paying past loans; there is a lack of financial literacy of farmers and of planning of agricultural activities etc. Furthermore, because of the COVID-19 pandemic, fresh weekly markets for fruit and vegetables have slowed down, and it has become more difficult for small farmers in peri-urban areas to access these markets. Therefore, improving access to finance is pivotal for empowering smallholder farmers again climate change.
WHY WILL IT WORK?	a. Secure tenure rights and sustainable land management can strongly contribute to strengthening local food systems and making them more sustainable. As a result, development of land banking instruments and promoting the system could contribute positively to food security, considering that the COVID-19 has demonstrated the importance of food security and utilizing local natural resources to strengthen local food production. b. According to the World Bank, 'digitalization of agriculture and food supply and delivery channels can provide ways to modernize the agri-food system'. This includes expansion of e-commerce, digital technologies to link producers and traders, processors, buyers' concerning COVID-19. For instance, the Ministry of Agriculture and Forestry of Turkey launched the Digital Agricultural Market (which is called as DITAP) in 2020, which will enable producers to earn more income and enable sellers to find agricultural products of the quality that the agricultural industry seeks, and consumers to access agricultural products cheaper. Stakeholders using DITAP will also be able to benefit from the supportive loan packages created within the scope of contracted agriculture.

HOW WILL IT WORK?	Proposed solutions cover the following specific (non-exhaustive) activities/areas: • Develop land banking instruments; • Strengthen responsible private and public investments to create decent jobs and support especially family farmers and micro, small and medium agricultural enterprises, with a focus on gender and youth; • Digitalization of agriculture and food supply and delivery channels can provide ways to modernize the agri-food system. • Simple micro-finance mechanisms should be identified for farmers especially for small-sized, subsistence and semi-subsistence farms; • Financial literacy should be increased; • Upgrade small scale food distribution and processing including in the informal sector by integrating them in urban planning, training and financing programs, with due attention to food safety issues and decent work.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	68	**The Building Resilience Tool** allows farmers' organisations and their farmer members to assess holistically the risks to their farming activities and to build resilience by identifying solutions on how to mitigate risks and damage that hazards and climate change cause to farmers. (AgriCord alliance, a network of farmers' associations)
	69	**Landscape restoration focused on watershed management units** to address the drivers of landscape degradation, reduce the risk of conflict and help communities adapt and transform in the face of climate change. Environmental resilience in watershed areas; social resilience through community-led, participatory, action-learning oriented initiatives; and economic resilience through more efficient linkage of producer groups, associations or cooperatives with markets. Solutions that are community-owned and managed. Government policies that support these practices are linked to the area, while local by-laws are designed to foster local ownership (World Vision)
	70	**Reducing vulnerabilities to external shocks** by strengthening the capacity of the farming sector in Guatemala: crop diversification, best practices of management, traceability, irrigation and micro-tunnels (Alianza Agroindustrial Artesanal Rural)
	71	**Smallholder farmers in Honduras**: drought-resistant varieties, micro-green houses, irrigation, crop diversification (Asociación de Productores Agropecuarios de Intibucá, World Farmers' Organisation).
	72	**Adaptation to Climate Change, water management & environmental resilience** (Turkey, France)

17. INNOVATION FOR CLIMATE MITIGATION

WHAT IS THE IDEA ABOUT?	This theme brings together innovative solutions in climate change adaptation and mitigation to promote the transformation of the food production and consumption systems for building resilience to climate vulnerabilities, and other shocks. On the production side, it is crucial to shift to more environmentally friendly activities that reduce greenhouse gas emissions while securing the income of producers, especially in rural areas. On the consumption side, it is necessary to raise consumers' awareness on sustainable and healthy consumption. Finally, to build resilient global and local food systems capable of withstanding climate change and global disease outbreaks, such as the COVID-19 pandemic, it is pivotal to build and strengthen mutual relationships between producers, food-related business and consumers, especially at the local level.
WHY IS IT NEEDED?	Agriculture, food production, and deforestation are major drivers of climate change. Agriculture, forestry and other types of land use account for 23% of human greenhouse gas emissions; deforestation, peatland burning, and wood harvest are directly contributing around 13% of human-caused carbon dioxide emissions (IPCC, 2019). These challenges are projected to increasingly worse well into the future, and business as usual or current practices will only stretch them further. Therefore, transforming food production and consumption systems through innovative approaches is necessary for building resilience to climate vulnerabilities, shocks and other stresses.
WHY WILL IT WORK?	Innovative solutions throughout the food system, from production to consumption, will help to effectively advance adaptation and mitigation efforts. On the production side, promoting resource mobilization from the private sector can support the evaluation of environmental burdens brought by production activities, as well as the application of technologies that can have beneficial impacts on the environment, including the conservation of ecosystems. Private investments can also be used to leverage innovation, which can strengthen the supply chain resiliency and enhance sustainable production. F*or instance, the government of Japan is planning to develop a new strategy called "Measures for achievement of Decarbonization and Resilience with Innovation (MeaDRI)", which aims to build sustainable food production systems.* On the consumption side, promoting food education that supports "sustainable diet" in consideration of environment and health can encourage a shift to more environmentally friendly activities of producers, processors and distributors. Finally, to increase the resilience of global and local food systems, it is important to connect production and consumption sides. In this regard, the Japanese initiative called "Local production for local consumption" aims to establish resilient food systems by building relationships between producers and consumers.
HOW WILL IT WORK?	Proposed solutions cover the following specific (non-exhaustive) activities/areas: • Increase private investment to promote innovation, such as smart agriculture leading toward the transformation of production forms and efforts that will lead to GHGs reduction; • International organizations should establish standards for environmentally friendly dietary habits; • Promote mutual relationships between producers, food-related business and consumers, especially at the local level.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	73	**Lowering the carbon footprint of farms while coping with Covid19 in New Zealand**: tree planting, riparian protection, stock shelters, tool indexes for methane efficiency, online trade (Federated Farmers of New Zealand)
	74	**Forest and Farm Facility (FFF)** channels funding directly to smallholder farmer, forest communities and indigenous peoples. Funding comes from EU, Germany, Holland, Finland, Norway, Sweden, USA and IKEA. It has formal member state agreement in Bolivia, Ecuador / Ghana, Kenya, Liberia, Madagascar, Togo, Zambia / Nepal, Viet Nam. Its goal is 'improved livelihoods in climate resilient landscapes' with a set of 30 climate resilience options about which peer-to-peer learning is developed. (FAO, IUCN, Agricord and IIED)
	75	**Climate-smart agriculture and efficient use of water resources in Belgium** (Flander): reuse of water and precision irrigation (Flemish Young Farmers Association).
	76	**Farmer Managed Natural Regeneration (FMNR)** increases communities' ability to adapt to climate change while mitigating against it (i.e. tree cover increase). Endorsed and implemented by several African countries (Nigeria, Ethiopia, Malawi) and institutions (WEF trillion tree program, ICRAF, WRI, World Bank) (World Vision, Global Evergreen Alliance)
	77	**RACE to scale Regenerative Food Systems** is a platform concept developed by several institutions and the COP26 Race to Zero team. It seeks to halt land degradation, reduce food-related emissions and enhance resilience in food systems, including rebuilding soil health, and enhancing crops and rural community resilience. By 2030, over 50% of the world's agricultural land (75% in Europe, US) is farmed in a way that drives positive outcomes for people and nature. Resilience-related goals: (a) Carbon sequestration in soil, (b) Enhanced resilience of crops while reducing synthetic inputs, (c) communities are resilient. RACE will take the form of a 'movement', with farmer empowerment the primary engine for change. These clusters will also include farmers, finance providers, consumer groups, youth networks, government and civil society. (SYSTEMIQ, WBCSD, IUCN)
	78	**Measures for achievement of Decarbonization and Resilience with Innovation (MeaDRI)** for strengthening supply chains (Japan)

18. SMALL ISLAND STATES AND COASTAL AREAS

WHAT IS THE IDEA ABOUT?	With a focus on Small Island Development States (SIDS) and Coastal Areas, this theme brings together game changing solutions in climate change adaptation, mitigation and resilience to promote and scale-up the transformation of food systems to be more resilient to climate change and other shocks and thereby effectively contribute towards food security, sustainable development and climate goals. The solutions address key dimensions of the food systems to build resilience, including through climate resilience financing, blue transformation for resilient coastal and communities, resilient aquaculture and aquatic food systems, water and soil management, promotion of inclusive local and sustainable food systems.
WHY IS IT NEEDED?	Because of their geographic isolation, exposure and limited natural resources, Small Island Developing States (SIDS) often share a unique set of circumstances, such as vulnerability to natural disasters or reliance on imports. The world's SIDS face many similar challenges, including limited land mass and arable land; small, and often scattered, populations; fragile natural environments; dependence on imported energy sources; high vulnerability to climate change, natural disasters and external economic shocks; heavy reliance on food imports; a limited number of economic sectors; distance from global markets; malnutrition (undernutrition, micronutrient deficiencies, and overweight and obesity); and high rates of diet-related non-communicable disease. Despite producing just one percent of global carbon dioxide emissions, SIDS are most affected by the impacts of climate change, facing impending existential threats and imminent environmental catastrophe. Climate change is expected to further aggravate seasonality through increased drought frequency, disruption of food production by floods and tropical storms, increasing and more variable temperatures, and more erratic rainfall. SIDS in particular are and will continue to suffer from these effects of climate change, including as the result of cyclones and hurricanes, rising sea levels and eroding coastlines. These changes exacerbate their already fragile natural environments making it more difficult to produce sufficient food at reasonable cost to meet their dietary needs. In addition, the complex set of food security and nutrition challenges, have been further aggravated by the COVID-19 pandemic. The achieve the goals of the 2030 Agenda for Sustainable Development, the Paris Agreement and the SAMOA pathway, SIDS require support to create enabling environments for food security and nutrition, transform food systems to improve nutrition-sensitivity, resilience and sustainability and empower people and communities to lead healthy and productive lives.
WHY WILL IT WORK?	Shifting to sustainable, nutrition-sensitive agri-food systems holds the key to addressing food security and nutrition challenges in SIDS. Reflecting the goals of the Global Action Programme on Food Security and Nutrition in SIDS, food systems need to support local family-based production, while supplying sufficient quantities of food that is high-quality, affordable, diverse and nutritious. Food systems should also promote the sustainable management and use of natural resources. This transformation can help curb SIDS' reliance on imports, promote healthy diets and reverse trends in obesity. Promoting climate change adaptation and the sustainable management of natural resources will help build resilience, preserve biodiversity, and improve response to climate change impacts and natural disasters to develop more efficient local food value chains. Stepping up commitment, scaling up

	empowerment of communities and countries and supporting and investing in SIDS can help avoid the poverty trap, empower people and communities (especially women and youth), generate jobs and income, and boost national economic growth across all sectors.
HOW WILL IT WORK?	Providing policy advice, analysis and technical assistance in agriculture, fisheries, forestry and natural resources management, proposed solutions under this thematic area cover the following specific (non-exhaustive) activities/areas: • Support to the implementation in the Global Action Programme on Food Security and Nutrition in SIDS (GAP) through up-scaled investment; • Climate services, climate Data, statistical capacities, tools to inform decision-making, planning and investment. • Sustainably boost domestic food production in SIDS, ensuring farmers have access to productive inputs and financing, including through training of farmers on sustainable water use (water harvesting, drip irrigation, contour farming) and promoting climate-resilient agricultural technologies such as hurricane-resistant shade houses, drought-tolerant seed and other modern technologies to sustain local production. • Domestic policies to promote local, nutritious, sustainable food systems and diets, including aquatic foods, reducing reliance on processed and imported food. • Adaptive management of fisheries, building capacity for management • Technological innovation and promoting bioeconomy, reducing food loss and waste and, in particular post-harvest losses. • Involving, engaging and enabling youth in driving and implementing transformative solutions for food systems adaptation and mitigation of emissions in SIDS and coastal areas.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	79	Building Resilient Food Systems in Small Islands Developing States (*SIDS)*
	80	Farmers' resilience to climate change in St Kitts & Nevis: regenerative agriculture in small landplots, local production of organic fertilizers and pesticides, water tanks, free range chickens, diversification of income (nut oil) (World Farmers' Organisation).
	81	Resilience, Innovation and Knowledge in Montserrat: Water harvesting, drip irrigation with solar pumps, protected agriculture (windbreaks, greenhouses) (Monserrat Farmers Association)
	82	Oyster cultivation contingency measures in Ecuador (Cooperativa de Pescadores Artesanales "Virgen de Regla")
	83	Climate-proofing Coastal Fisheries, better storage and micro-canning, access to nutrient-rich small fishes for better nutrition, diminishing losses in fish catches (WWF).
	84	Adaptive fisheries management plans and policies, precautionary catch management, and predicting the future distribution of stocks and populations. Technological innovation to reduce post-harvest losses. Strengthened domestic policies supporting the role of aquatic foods in delivering nutritional security and food security (WWF, Environmental Defense Fund)
	85	Blue transformation for resilient coastal communities, resilient aquaculture & aquatic food systems (FAO-NGOs).

19. ARID, SEMI-ARID LANDS AND DESERTS

WHAT IS THE IDEA ABOUT?	Characterized by water deficits for most of the year, seasonal climate extremes and unpredictable rainfall patterns, arid and semi-arid areas are already fragile. Environmental factors interact with the development of socio-economic activities. Climate changes increase the challenges. It is not just a question of higher temperatures. It involves changes that drastically alter the functioning of ecosystems. Further these risks, and certainly partly because of them, these arid and semi-arid territories endure various conflicts that alter livelihood and security of households. Since a number of factors are putting the resilience of small producers farmers and pastoralists - and food systems more generally- at risk, their local knowledge needs to be preserved and their capacities be strengthened. It is particularly the case in arid and semi-arid territories, where small farmers may be the only ones able to make use of the lands in a sustainable manner. Therefore, several game-changing solutions should target and involve this population, strengthening pastoralism, agroforestry, storage capacity, community solidarity mechanisms and calling programmes and public policies for more multi-sectoral approaches.
WHY IS IT NEEDED?	Small-scale farmers and pastoralists, who are likely to suffer from hunger, are vital for feeding both rural and urban people and for maintaining nutritional diversity. As they mostly serve domestic markets, they are particularly important in times when trade is compromised. They certainly are the people able to prevent arid and semi-arid lands from desertification. But they endure extreme constraints from climate change (semi-arid and arid pastures bear more severe water scarcity, will likely have reduced livestock productivity, while nutritional quality will be affected by CO2 fertilisation) and major conflicts (Sahel, Middle East) disturbing security, education, economy and social life. If they are not supported and strengthened, food systems of many countries might collapse. In another hand, with climate change, the global aridity on our planet will increase (as predicted under current climate change -IPCC RCP8.5 scenario-) leading to abrupt changes. Some territories will experience drier ecosystems (with drops in soil fertility, increased erosion and reduced food and biomass production). Learning from current arid and semi-arid areas can help build resilience in newly threatened areas.
WHY WILL IT WORK?	We can note that most of these territories at risks are currently subject to conflicts, exacerbating their fragilities, affecting global balances and leading to migrations. The growing huge impacts of climate change, therefore, mobilize the international community to support these countries and communities facing these challenges. The benefits of integrated policies and programmes have already been demonstrated in particular in these territories with the involvement of national and local authorities as well as local people. Even if it is not progressing as fast as expected, the Great Green Wall becomes a reality and associated with agroecology, revealed its positives impacts, more than just growing trees and plants (improving soil quality, preventing floods, providing shade for livestock, contributing to reduce heat waves, boosting crop production, and providing other services for people). Promoting storage capacity for both human food and animal feeding increases resilience of households and farmers, in particular in time of pandemic and drought and other shocks, preserving assets for coming growing seasons.

HOW WILL IT WORK?	Possible solutions cover the following specific (non-exhaustive) activities/areas: • Recognising, supporting, scaling up and improving the logic **of matching variability in inputs with variability in production processes**. It is key to secure relative but sustainable stability in outputs for modern food systems in the face of climate change. With regard to pastoral systems and their integration with crop farming and the wider economy, this starts from supporting, **scaling up and improving pastoral strategic mobility**. [national and local authorities, communities, research] • Regularly subjected to droughts, there is a clear need to protect farmers' assets and particularly livestock. Preventing such loss is critical for food system resilience. Thus, in time of drought shocks, **feed reserves** should be supported, in particular with **index-based livestock insurance**. This kind of mechanism targets resilience building that sustainably protects pastoral livelihood. [farmers and pastoralists, local authorities, insurance sector, research] • Recognising that diversification and the accumulation of assets and knowledge are essential elements of resilience, the concept of 'Resilience Funds' is built around an approach centred on agro-pastoral communities - made up of men and women - that links and integrates productive, financial and social activities. The approach allows communities to fully exploit their existing capacities and to have different options (productive, financial and social) to better anticipate, react and adapt to risks and crises related to rural living conditions. • Structuring investment on land and water for erosion control, water harvesting, land restoration, supplemental irrigation, lowlands. • As it is the case with the Green Great Wall, **agroforestry** has to be scaled up, embedded in national -and international policies, for all its multiple co-benefits for soil, animals, farming and household. [famers, research, national and local authorities, NGOs] • Research and selection of drought-resistant species (plants and animals) • Anticipation of climatic events (drought) through weather forecasts. • Finally, the cluster asks for the adoption of a **new approach for policies, projects** and supports, notably in arid and semi-arid land, often exposed to conflicts: efforts of concentration over several years on specific targeted communities, multi-sectorial and context-specific approaches, strengthening and involving small farmers, and based on complementary partnerships for their implementation [donors, national and local authorities, communities].

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE I & WAVE 2	86	**Resilience for Pastoral Systems** combining animal feed reserves, institutionalizing index-based insurance which provides mitigation to the shocks and creating market linkages for livestock (ILRI, CGIAR)
	87	**Valuing Rangeland Variability: A global initiative for Mobile Pastoralism** as a necessary path to both sustainable and resilient agriculture and social justice in the face of climate change. Resilient and adaptable food-producing systems managed by 500 million people, managing and stewarding 50% of the world's land surface, including tundra, savannas, grassland and desert margins, and cover an estimated. Flexible land-tenure systems, high levels of domestic animal diversity within the herd, and reliance on complex learned behaviours as well as on genetic traits in livestock breeding (Maryam Niamir-Fuller, UNEP, IYPR).
	88	**Scaling up resilience in fragile and conflict settings through integrated and sustained action.** Sahel Resilience Initiative (Burkina Faso, Chad, Mali, Mauritania, Niger) **(**Germany-WFP).
	89	**Agroforestry practices in arid and semi-arid lands (**World Farmers' Organization)
	90	Increase public and private sector investments and programming by **prioritizing Pastoral food security and resilience.** Facilitate private sector led early offtake of drought threatened livestock through smart policies and an enabling environment. Commercialized livestock destocking as a response to drought in drylands (USA)

3.2 CLIMATE RISK REDUCTION & MANAGEMENT

CO-LEADS:

- PETER LADERACH (WFP);
- UNDRR (TBC), JAPAN (TBC), USA (TBC)

20. CLIMATE INSURANCE PRODUCTS

WHAT IS THE IDEA ABOUT?	Climate plays a key role in crises that are rooted in food system failures. Therefore, climate action is a critical entry point for transforming food systems. SC 3.2 climate risk reduction and management, focuses on actions to mitigate the impacts of climate variability and climate-driven disasters deploying **solutions that rely on (climate) information to trigger action, programming, relief and finance**. Information and knowledge about climate-related events, trends or forecasts are used in climate risk reduction and management (CRRM) for climate-resilient decision-making, with the goal of reducing the potential negative impacts of climate on climate-sensitive sectors (i.e. agriculture), communities or geographical areas[16]. CRRM is in line with the general concept of disaster risk management, which involves activities related to 1) **Risk Prevention** (measures to avoid existing or new hazards); 2) **Risk Management** (mitigation, i.e. limiting the impact of hazards, and preparedness, i.e. anticipate, respond to, and recover from the impacts of hazards); 3) **Risk Transfer** (transferring the financial consequences of future risk from one party to another). CRRM therefore covers a diverse set of measures and approaches, from early warning systems, the provision of climate information, seasonal forecasts or analytical approaches to evaluating the probability for climate risks, to financial instruments, education and knowledge development. capacity building, national planning and investment, infrastructure design or strengthening institutional and legislative arrangements [17] [18]. While many of these approaches and concepts are represented in SC 3.2 by the submitted game changing solutions, three priority approaches can be identified: 1-Climate Insurance Products (CIP), 2-Climate Information Services (CIS) and 3-Early Warning Systems (EWS). These three approaches build the three thematic coalitions of SC 3.2.
WHY IS IT NEEDED?	Ideally, a sustainable food system would support multiple Sustainable Development Goals (SDGs), among others, SDG2 (zero hunger) SDG13 (Climate Action), SDG12 (Responsible production and consumption), SDG15 (Life on Land) and SDG16 (Peace, justice and strong institutions). However, being cognizant of the tremendous numbers of undernourished, stunted, overweight or obese people, the enormous amount of food lost and wasted, as well as the impacts of food systems on local and global ecosystems, the reality looks quite different. Our current food systems do not deliver sustainable outcomes, either for food and nutrition, or for social, economic or environmental aspects (see figure). Cross cutting vulnerabilities have therefore become a deeply ingrained feature of our food systems. Climate and food systems are in a reciprocal relationship: On the one hand, climate-related disasters, next to other shocks, are a major threat to the stability of global, national, and local food systems – the entire food supply chain and food environment are affected, with negative consequences on sustainability outcomes, especially people's nutrition and health. On the other hand, unsustainable food systems are known to cause deforestation or soil

[16] Travis, William R., and Bryson Bates. "What is climate risk management?." (2014): 1-4.
[17] https://www.preventionweb.net/disaster-risk/concepts/drr-drm/
[18] https://www.undrr.org/terminology

	degradation (contributing to climate change), and food production is responsible for 19 to 29% of global greenhouse gas emissions[19]. An unsustainable food system is vulnerable, and lacks the capacity to cope with sudden shocks. Furthermore, food systems failures can lead to crises (e.g., food insecurity, malnutrition, loss of biodiversity, desertification etc.). Crises can then reinforce exogenous shocks (e.g., create or intensify conflicts over resources). It is reasonable to assume that many crises are rooted in food system failures, and that climate plays a key role in this. Hence climate action, including climate risk reduction and management to prevent, mitigate, transfer and prepare for risks is a critical entry point for action. These climate actions, potentially the most transformative ones, all rely heavily on (climate) information to trigger action, programming, relief and finance.
WHY WILL IT WORK?	There are different insurance-based risk transfer products available. Climate insurance products are increasingly designed as index-based or weather index insurance. CIP can reduce the immediate and long-term financial consequences associated with extreme weather events such as floods or drought, hence supporting mechanisms to reduce vulnerability. In contrast to traditional insurances, index-based insurance payouts are pegged on the basis of an index, e.g. rainfall or vegetation levels, that is measured in a transparent and objective way, obtainable at low cost, not manipulable, and highly correlated with exposures to be transferred[20]. When an index threshold is reached, the insured party receives compensation within a short time after the event without the need to proof of loss. Such insurance products are not only advantageous because they enable immediate liquidity, but also because they can be adapted to target a specific climate risk. There are examples from literature and practice determining the value of index-based insurance for agricultural production. A study conducted in Bangladesh assessed the effectiveness of an index-based insurance for farmers to better manage their crop production risks during the monsoon season[21]. They found that the insurance had both positive ex ante and ex post effects on risk management and income, respectively. Another example is the Agriculture and Climate Risk Enterprise (ACRE), an insurance for protection against drought, excessive rainfall and yield losses, scaled to nearly 200,000 farmers and combines index insurance with agricultural credit and farm inputs[22].
HOW WILL IT WORK?	The thematic coalition 1 of SC 3.2 comprises game-changing solutions related to insurance-based risk transfer products. The largest coalition submitted is the **InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance Solutions (IGP).** It puts forward an actionable and transformative agenda to strengthen the resilience of poor and vulnerable people from the impacts of disasters and protect their lives and livelihoods. Working through a grand coalition of multi-stakeholder actors, the IGP promotes the scale-up of pre-arranged, predictable financing for early action, relief and recovery embedded in climate and disaster risk management strategies. Since its launch at the 2017 UN Climate Change Conference in Bonn, more than 75 members have joined the partnership. Among the partners are the World Bank Group, the UNP, OECD, Red Cross Red Crescent Climate Centre, and Munich Re.

[19] Vermeulen SJ, Campbell BM, Ingram JSI. Climate Change and Food Systems. Annual Review of Environment and Resources. 2012; 37: 195–222.
[20] Chantarat, Sommarat, et al. "Index-based risk financing and development of natural disaster insurance programs in developing Asian countries." *Resilience and Recovery in Asian Disasters*. Springer, Tokyo, 2015. 171-200.
[21] Hill, R. V., Kumar, N., Magnan, N., Makhija, S., de Nicola, F., Spielman, D. J., & Ward, P. S. (2019). Ex ante and ex post effects of hybrid index insurance in Bangladesh. *Journal of Development Economics*, *136*(8), 1–17. https://doi.org/10.1016/j.jdeveco.2018.09.003
[22] Salama, Kilimo. "Fact Sheet: Kilimo Salama ("Safe Agriculture")." (2010).

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	91	Insu-resilience for Climate and Disaster Risk Finance and Insurance solutions (CGIAR/WFP)
	92	The Index-based livestock insurance (IBLI) which has been operational in Kenya and Ethiopia since 2010 and is now set to offered in different parts of the Horn of Africa. It is a financial solution, whereby insurance products are offered to pastoral communities against drought related risks. IBLI has been integrated in the Satellite Index-Insurance for Pastoralists in Ethiopia (SIIPE) program in the Somali region of Ethiopia, a livelihood protection program supported by WFP.
	93	Production finance in disaster areas of **South Africa**: weather-proof contract agriculture with cooperatives, financed inputs, weather-related insurance, to protect smallholder farmers against shocks (Southern African Agri Initiative, SAAI)

21. CLIMATE INFORMATION SERVICES

WHAT IS THE IDEA ABOUT?	Climate plays a key role in crises that are rooted in food system failures. Therefore, climate action is a critical entry point for transforming food systems. SC 3.2 climate risk reduction and management, focuses on actions to mitigate the impacts of climate variability and climate-driven disasters deploying **solutions that rely on (climate) information to trigger action, programming, relief and finance**. Information and knowledge about climate-related events, trends or forecasts are used in climate risk reduction and management (CRRM) for climate-resilient decision-making, with the goal of reducing the potential negative impacts of climate on climate-sensitive sectors (i.e. agriculture), communities or geographical areas[23]. CRRM is in line with the general concept of disaster risk management, which involves activities related to 1) **Risk Prevention** (measures to avoid existing or new hazards); 2) **Risk Management** (mitigation, i.e. limiting the impact of hazards, and preparedness, i.e. anticipate, respond to, and recover from the impacts of hazards); 3) **Risk Transfer** (transferring the financial consequences of future risk from one party to another). CRRM therefore covers a diverse set of measures and approaches, from early warning systems, the provision of climate information, seasonal forecasts or analytical approaches to evaluating the probability for climate risks, to financial instruments, education and knowledge development. capacity building, national planning and investment, infrastructure design or strengthening institutional and legislative arrangements [24] [25]. While many of these approaches and concepts are represented in SC 3.2 by the submitted game changing solutions, three priority approaches can be identified: 1-Climate Insurance Products (CIP), 2-Climate Information Services (CIS) and 3-Early Warning Systems (EWS). These three approaches build the three thematic coalitions of SC 3.2.
WHY IS IT NEEDED?	Ideally, a sustainable food system would support multiple Sustainable Development Goals (SDGs), among others, SDG2 (zero hunger) SDG13 (Climate Action), SDG12 (Responsible production and consumption), SDG15 (Life on Land) and SDG16 (Peace, justice and strong institutions). However, being cognizant of the tremendous numbers of undernourished, stunted, overweight or obese people, the enormous amount of food lost and wasted, as well as the impacts of food systems on local and global ecosystems, the reality looks quite different. Our current food systems do not deliver sustainable outcomes, either for food and nutrition, or for social, economic or environmental aspects (see figure). Cross cutting vulnerabilities have therefore become a deeply ingrained feature of our food systems. Climate and food systems are in a reciprocal relationship: On the one hand, climate-related disasters, next to other shocks, are a major threat to the stability of global, national, and local food systems – the entire food supply chain and food environment are affected, with negative consequences on sustainability outcomes, especially people's nutrition and health. On the other hand, unsustainable food systems are known to cause deforestation or soil degradation (contributing to climate change), and food production is responsible for 19 to 29% of global greenhouse gas emissions[26]. An unsustainable food system is vulnerable, and lacks the capacity to cope with sudden shocks. Furthermore, food systems failures can lead to crises (e.g., food insecurity, malnutrition, loss of biodiversity, desertification etc.). Crises can then reinforce exogenous shocks (e.g., create or intensify conflicts over resources). It is reasonable to assume that many crises are rooted in food

[23] Travis, William R., and Bryson Bates. "What is climate risk management?." (2014): 1-4.
[24] https://www.preventionweb.net/disaster-risk/concepts/drr-drm/
[25] https://www.undrr.org/terminology
[26] Vermeulen SJ, Campbell BM, Ingram JSI. Climate Change and Food Systems. Annual Review of Environment and Resources. 2012; 37: 195–222.

	system failures, and that climate plays a key role in this. Hence climate action, including climate risk reduction and management to prevent, mitigate, transfer and prepare for risks is a critical entry point for action. These climate actions, potentially the most transformative ones, all rely heavily on (climate) information to trigger action, programming, relief and finance.
WHY WILL IT WORK?	Climate Information Services, comprise the generation, provision and contextualization of climate information for decision-making. CIS can reduce climate vulnerability by enhancing information access, knowledge exchanges, and networks, it is key for adapting to climate variability and extremes[27]. CIS, focusing on the use of historical information, seasonal forecasts, and long-term climate projections, is an important tool in climate risk management existing at local, national, regional, and international scales in sectors like agriculture, forestry or health, among others[28]. There are examples from literature and practice determining the value of CIS for farmers. Chiputwa et al., (2020) assessed the effectiveness of a Multi-disciplinary Working Group (MWG) that produces CIS in Senegal. They found that MWGs increase farmers' awareness (+18%), access (+12%) and uptake (+10%) of WCI, resulting in farm management responses depending on the type of information used.
HOW WILL IT WORK?	The thematic coalition 2 of SC 3.2 comprises game-changing solutions related to climate information services. Three solutions have been assigned so far (Table 1). The largest coalition submitted is the **Blueprint for Digital Climate-Informed Advisory Services (DCAS).** It provides a roadmap for getting DCAS to scale and reaching an additional 300 million smallholders by 2030. To strengthen food security and build climate change resilience, the CIS community, investors, governments, and DCAS users will need to: commit to and implement principles of good practice; build partnerships allowing for the development, deployment, and improvement of DCAS, and identify key strategies for reaching scale. In addition, DCAS can support smallholder farmers adapt their traditional practices to ongoing and future climatic changes. Among the partners are the Global Center on Adaptation, the World Resources Institute, WFP, the World Business Council for Sustainable Development, Columbia University, CCAFS/CGIAR, as well as member countries such as Bangladesh, Malawi, Japan or Germany, as well as member countries such as Bangladesh, Malawi, Japan.

[27] Vaughan, C., & Dessai, S. (2014). *Climate services for society : origins , institutional arrangements , and design elements for an evaluation framework*. *5*(October). https://doi.org/10.1002/wcc.290

[28] Vermeulen SJ, Campbell BM, Ingram JSI. Climate Change and Food Systems. Annual Review of Environment and Resources. 2012; 37: 195–222.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	94	**Digital Climate Informed Advisory Services (DCAS)** to help people and value chains address climate impacts, as part of the Blueprints by the Global Commission on Adaptation to build the resilience of 300 million small-scale agricultural producers by 2030. Goal for 2025 to cover at least 30 million farmers in Africa. AfDB committed to mobilise $2 billion for DCAS (Columbia University, CCAFS, WRI, WBCSD, AGRA, Global Commission on Adaptation)
	95	**The Alliance for Hydromet launched at COP25** to strengthen the capacity of countries to deliver high-quality weather forecasts, early warning systems, water, hydrological and climate services, and resilient development by protecting lives, property and livelihoods. The Alliance includes the Adaptation Fund, the World Bank, African Development Bank (ADB), the Asian DB., the European Bank for Reconstruction and Development, the Climate Investment Funds, the Global Environment Facility, the Green Climate Fund, the Islamic Development Bank, UNDP, UNEP, WFP and WMO
	96	**Climate risk profiling (using AI)** tailored local weather patterns and 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 (WINnERS project, with MunichRE). Climate KIC

22. CLIMATE EARLY WARNING SYSTEMS

WHAT IS THE IDEA ABOUT?	Climate plays a key role in crises that are rooted in food system failures. Therefore, climate action is a critical entry point for transforming food systems. SC 3.2 climate risk reduction and management, focuses on actions to mitigate the impacts of climate variability and climate-driven disasters deploying **solutions that rely on (climate) information to trigger action, programming, relief and finance**. Information and knowledge about climate-related events, trends or forecasts are used in climate risk reduction and management (CRRM) for climate-resilient decision-making, with the goal of reducing the potential negative impacts of climate on climate-sensitive sectors (i.e. agriculture), communities or geographical areas[29]. CRRM is in line with the general concept of disaster risk management, which involves activities related to 1) **Risk Prevention** (measures to avoid existing or new hazards); 2) **Risk Management** (mitigation, i.e. limiting the impact of hazards, and preparedness, i.e. anticipate, respond to, and recover from the impacts of hazards); 3) **Risk Transfer** (transferring the financial consequences of future risk from one party to another). CRRM therefore covers a diverse set of measures and approaches, from early warning systems, the provision of climate information, seasonal forecasts or analytical approaches to evaluating the probability for climate risks, to financial instruments, education and knowledge development. capacity building, national planning and investment, infrastructure design or strengthening institutional and legislative arrangements [30] [31]. While many of these approaches and concepts are represented in SC 3.2 by the submitted game changing solutions, three priority approaches can be identified: 1-Climate Insurance Products (CIP), 2-Climate Information Services (CIS) and 3-Early Warning Systems (EWS). These three approaches build the three thematic coalitions of SC 3.2.
WHY IS IT NEEDED?	Ideally, a sustainable food system would support multiple Sustainable Development Goals (SDGs), among others, SDG2 (zero hunger) SDG13 (Climate Action), SDG12 (Responsible production and consumption), SDG15 (Life on Land) and SDG16 (Peace, justice and strong institutions). However, being cognizant of the tremendous numbers of undernourished, stunted, overweight or obese people, the enormous amount of food lost and wasted, as well as the impacts of food systems on local and global ecosystems, the reality looks quite different. Our current food systems do not deliver sustainable outcomes, either for food and nutrition, or for social, economic or environmental aspects (see figure). Cross cutting vulnerabilities have therefore become a deeply ingrained feature of our food systems. Climate and food systems are in a reciprocal relationship: On the one hand, climate-related disasters, next to other shocks, are a major threat to the stability of global, national, and local food systems – the entire food supply chain and food environment are affected, with negative consequences on sustainability outcomes, especially people's nutrition and health. On the other hand, unsustainable food systems are known to cause deforestation or soil degradation (contributing to climate change), and food production is responsible for 19 to 29% of global greenhouse gas emissions[32]. An unsustainable food system is vulnerable, and lacks the capacity to cope with sudden shocks. Furthermore, food systems failures can lead to crises (e.g., food insecurity, malnutrition, loss of biodiversity, desertification etc.). Crises can then reinforce exogenous shocks (e.g., create or intensify conflicts over resources). It is reasonable to assume that many crises are rooted in food

[29] Travis, William R., and Bryson Bates. "What is climate risk management?." (2014): 1-4.
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[31] https://www.undrr.org/terminology
[32] Vermeulen SJ, Campbell BM, Ingram JSI. Climate Change and Food Systems. Annual Review of Environment and Resources. 2012; 37: 195–222.

	system failures, and that climate plays a key role in this. Hence climate action, including climate risk reduction and management to prevent, mitigate, transfer and prepare for risks is a critical entry point for action. These climate actions, potentially the most transformative ones, all rely heavily on (climate) information to trigger action, programming, relief and finance.
WHY WILL IT WORK?	Early Systems are an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events. There are examples from literature and practice determining the value of EWS, e.g., for agricultural production. An EWS example of the Gash basin of Sudan shows how flood- forecasting models, integrated with other techniques, can warn farmers and government departments of the risks of sudden floods[33]. The tool can visualize the flood development, allowing stakeholders such as the Ministry of Water Resources of Sudan to plan for cropping activities, storing water and operating spate-irrigation systems, so that farmers' responses to floods change from being reactive, to planning for the event. Another example is a climate risk financing mechanism developed by WFP and partners, with the aim to support regions to prepare and manage climate-related risks[34]. Forecast-based Financing (FbF) for instance is based on climate predictions and EWSs to extend the lead-time of funds that are available to regions facing predicted climate-related shocks.
HOW WILL IT WORK?	The thematic coalition 3 of SC 3.2 comprises game-changing solutions related to early warning systems. The largest coalition submitted is the **Risk-informed Early Action Partnership (REAP).** It was launched at the UN Climate Action Summit in September 2019, and brings together an unprecedented range of stakeholders across the climate, humanitarian and development communities with the aim of making 1 Billion People Safer from disaster by 2025. REAP was established with the support of 24 convening partners and 15 countries. Among the partners are the UNP, WFP, CGIAR, GCF, FAO and many more.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	97	**The Risk-informed Early Action Partnership (REAP)** brings together an unprecedented range of stakeholders across the climate, humanitarian, and development communities. Early warning, early action. One billion more people living in the last mile in 50 countries are covered by financing and delivery mechanisms connected to effective early action plans, ensuring they can act ahead of predicted disasters and crises. (IFRC, WFP)

[33] Amarnath, G., Simons, G. W. H., Alahacoon, N., Smakhtin, V., Sharma, B., Water, I., & Lanka, S. (2018). Climate Risk Management Using smart ICT to provide weather and water information to smallholders in Africa : The case of the Gash River Basin , Sudan. Climate Risk Management, 22(September), 52–66. https://doi.org/10.1016/j.crm.2018.10.001'

[34] https://docs.wfp.org/api/documents/WFP-0000104963/download/?_ga=2.96730140.2079202718.1621346321-412082777.1613498852

3.3 INTEGRATED NATIONAL AND INTERNATIONAL POLICIES AND PLANS

CO-LEADS:
- CRISTINA TIRADO (WFP)
- Y. NASSEF/ M. MALETJANE (UNFCCC)
- SANDRINE DIXSON (AT5 CHAIR)
- SALEEMUL HUQ (AT5 CHAIR)

23. INTEGRATING RESILIENCE IN, AND ALIGNING NAPS, NDCS, DRR AND SDGS IN NATIONAL POLICIES & PLANNING

This cluster provides the landscape of international and national policies, strategies and plans to enable and guide a transformative change towards integrated climate resilient development. This includes, at the top level, the Nationally Determined Contributions (NDCs) and the national adaptation plans (NAPs) implemented through the UNFCCC as the forefront of international action to address climate change. There is also a wide range of planning instruments focusing on different issues (e.g. hazards, sectors, geographic regions) that bring about complementary efforts to achieve climate resilient development. Climate resilience is also increasingly becoming an inherent feature in all other regular development policies, strategies and plans.

WHAT IS THE IDEA ABOUT?	*The integrative framework for national adaptation plans and sustainable development (NAP-SDG iFrame) follows a systems approach to coordinating the different entry points or aspects* (e.g. climate hazards, sectors, actors, development goals and scale) of the adaptation planning cycle, and to manage coherence between the NAPs, SDGs, the Sendai Framework on disaster risk reduction, and other frameworks. It promotes nexus approaches in any combination of issues depending on national circumstances. The NAP-SDG iFrame is being applied in the formulation and implementation of NAPs.
WHY IS IT NEEDED?	Given the multiple possibilities for approaching a national adaptation assessment and consequently implementation, many countries find it difficult to achieve coherence between different approaches, and in the end, may not consider all relevant aspects simply because some components fall outside a given methodology. The most common question is whether to start with sectors and aggregate into a national picture or start with national cross-cutting issues and then consider sectors. In these cases, subnational/local plans and those addressing other aspects are usually completely left out. Another common observation is the desire to avoid working in silos if possible, while most approaches inevitably force countries to work within silos or individual sectors. The NAP-SDG iFrame dissolves working in silos and helps to manage different lenses to adaptation, opening completely new horizons and developments in the field of adaptation planning, implementation, monitoring and assessment, and knowledge management. The NAP-SDG iFrame promotes a nexus approach and many of its applications look at sets of interacting systems. Food systems are a classical feature of nexus approaches in combination with water, health, energy, ecosystems and many others.
WHY WILL IT WORK?	The NAP-SDG iFrame is already being applied in several countries in the formulation and implementation of their NAPs through the Open NAP initiative. The Open NAP initiative involves mobilization of the widest inputs from all interested and available actors and stakeholders – United Nations organizations, regional centres and networks, scientific community, and country experts, among others. It builds on collective experience, expertise

	and capacity that exists in the adaptation community. Early results from the application of the NAP-SDG iFrame demonstrate an enhanced approach to adaptation planning that would help transform systems resilience. Regarding food systems, agriculture and food security is the highest priority identified by countries in their national reports and processes under the UNFCCC, including the Nationally Determined Contributions (NDCs), NAPs, national adaptation programmes of action, and national communications. Moreover, the NDCs and the NAPs provide opportunities for different actors and stakeholders to strengthen, align or integrate specific issues including by systems (e.g. water, food, health), management level (e.g. regional, national, subnational) and hazards (e.g. floods, droughts, sea level rise, temperature shifts). The application of the NAP-SDG iFrame is therefore bound to significantly benefit climate resilience development in food systems.
HOW WILL IT WORK?	The development and application of the NAP-SDG iFrame is led by the UNFCCC Least Developed Countries Expert Group (LEG) as part of its ongoing work programme in supporting the 46 least developed countries in the formulation and implementation of their NAPs. The work is carried out with the support of the UNFCCC secretariat and the engagement of a wide range of organizations and experts, including United Nations organizations, regional centres and networks, scientific community, and country experts, among others. Progress of this work can be found in the reports of the LEG which are available at https://unfccc.int/topics/resilience/resources/documents-on-the-ldc-expert-group

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	98	**Integrative framework for NAPs and the SDGs (NAP-SDG iFrame) systems** approach to coordinating the different entry points (e.g., hazards, sectors, actors, development goals and scale) of the adaptation planning, and to manage coherence between the NAPs, SDGs, the Sendai Framework on DRR and other frameworks (UNFCCC & MS).
	99	**Linkages between climate change adaptation and disaster risk reduction by UNFCCC and UNDRR.** To support national teams to maximize synergy and coherence between activities on disaster risk reduction (DRR) under Sendai and adaptation activities in the NAP under the UNFCCC, within broader national development planning.
	100	Enhancing climate-related food systems resilience (Dominican Republic)
	101	**NDC-Food Systems Platform**. Reviews of how food systems transformation is addressed in the Nationally Determined Contributions (NDCs) and National Adaptation Plans. Most NDCs focus on energy, transport, and industry, with little focus on food systems in the context of mitigation and adaptation. Next NDC plans are due in 2025. (Future of Food)
	102	**Building links with COP26, UNFCCC, IPCC and climate talks**. Promote agroecology and regenerative agriculture to build resilience of food systems and enhance adaptive capacities to cope with climate extremes as well as the mitigation potential of agroecological food systems. Diversity, redundancy and connectedness. (Future of Food).
	103	**Food Systems Stability Board**, akin to the Financial Stability Board. Supporting countries in submitting 5-year food system risk assessment and resiliency plans which could be linked to NDCs. This proposal has several components; the one suggested here is focusing on *resilience planning (for 5 years) and integration in the NDCs* (WRI, FOLU).

24. RESILIENCE FRONTIERS FOR LONG-TERM RESILIENT FOOD SYSTEMS

The interconnectivity of development issues, the underlying shocks and stresses, and the widening landscape of international, regional and national frameworks requires foresight-driven and innovative approaches to resilience, particularly that centers around regenerative food production. Innovative approaches such as the Resilience Frontiers multi-agency initiative, are critical to guide underpinning assessments, scenario planning and pathways for the implementation of the different plans.

WHAT IS THE IDEA ABOUT?	The Resilience Frontiers initiative seeks to identify impactful and innovative actions that sow the seeds of transformative change that is needed to achieve long-term global resilience beyond 2030. It is currently at the start of its roadmapping phase which will apply a pioneering foresight methodology to identify a range of transformative actions. It proffers eight cross-cutting pathways that point people and planet towards resilient and desirable futures for all, while inspiring a paradigm shift by showcasing its growing ecosystem of bright light innovations, companies, organizations and projects impacting these pathways. While interconnected, one of the pathways under the initiative seeks to mainstream regenerative food production, and includes pioneering approaches such as air protein; innovative hydroponic projects; mosa meat; cell farm food tech; farming for generations; and good food institute.
WHY IS IT NEEDED?	Future food systems are threatened by present practices including lack of regenerative, sustainable and resilient food generation; inaccessibility and inadequacy of healthy and nutritious food; unhealthy production practices which include industrial production and monoculture, lack of respect for indigenous knowledge and practices, and overexploitation of resources resulting in soil degradation and water resources depletion. The food system and its activities have themselves become a threat to the planet, impacting its biodiversity, leading to climate change and increased food scarcity. The Resilience Frontiers pathway on regenerative food production addresses the perils facing future food security and sustainability through foresight methodologies that prioritise forward-looking actions that are innovative, regenerative, and driven by frontier technologies. It addresses the need for collective action through foresight driven futuristic actions building on indigenous wisdom and frontier technologies, leading to resilient food systems.
WHY WILL IT WORK?	The success of the Resilience Frontiers initiative is based on its ability to engage a variety of stakeholders among which are the private sector, technical experts, indigenous community leaders, youth and change makers who provide input and guidance for the direction, as evidenced through the engagement of thought leaders and visionaries. The initiative brings together pioneering innovations, companies, organizations and existing projects *(bright lights)* that carry the potential to accelerate people and the planet towards a transformed world that is resilient and can sustain desirable futures for all beyond 2030. These bright lights integrate elements of regeneration, no harm, durability, relevance, contribution to achieving sustained resilience and feasibility for implementation. Additionally, the bright lights respect the principles of inclusion, good governance, gender responsiveness, and inclusion of youth and indigenous communities as elements of focus in its activities driven by individuals and organizations. The ensuing prioritization process will be guided by three strategic advisory groups which include impact advisors, methodology advisors and frontier technology advisors.

HOW WILL IT WORK?	The Resilience Frontiers initiative comprises a collective intelligence process (2019–2021) followed by an implementation phase from 2021–2030, and with solutions expanding beyond 2030. The initiative spans partnerships from UN agencies, international NGOs, research institutes and youth networks. A rapidly growing collection of the Resilience Frontiers initiative bright lights is available at http://www.resiliencefrontiers.org/bright-lights.

INDIVIDUAL SOLUTIONS PRIOROTIZED IN WAVE 1 & WAVE 2	104	**The Resilience Frontiers Multiagency initiative coordinated by UNFCCC** seeks to identify impactful and innovative actions that sow the seeds of transformative change that is needed to achieve long-term global resilience beyond 2030. It is currently at the start of its roadmapping phase which will apply a pioneering foresight methodology to identify a range of transformative actions. It proffers eight cross cutting pathways that point people and planet towards resilient and desirable futures for all, including regenerative food production, while inspiring a paradigm shift by showcasing its growing ecosystem of bright light innovations, companies, organizations and projects impacting these pathways (UNFCCC).

25. INVESTING IN CLEAN ENERGY AND GREEN AND INCLUSIVE RECOVERY

WHAT IS THE IDEA ABOUT?	The first element of this thematic cluster is to promote investments in climate-resilient development pathways aligned with the WHO Manifesto. In response to the COVID-19 crisis, trillions of dollars of public funds have been allocated to economic recovery plans. Rather than aiming to return to pre-COVID19 business as usual -a world of persistent inequalities and insufficient action to achieve the SDGs and the Paris Climate Agreement-, there have been calls from international bodies, including the UNSG S and the OECD, to 'build back better' via a sustainable, resilient recovery. One such effort is the WHO Manifesto on a Healthy Recovery from COVID-19, which featured six key priority actions: i) Nature Protection; ii) Investing in essential services, from water and sanitation to clean energy; iii) Ensuring healthy energy transition; iv) Promoting healthy diets from sustainable food systems.; v) building healthy, liveable cities; and vi) embedding environmental health benchmarks in *financial recovery packages* (e.g. including investing in low-carbon sectors). The second element of this thematic cluster specifically concerns scaling up efforts to ensure universal access to clean energy, and align these efforts with food security and resilience in particular i) modern cooking facilities; ii) productive uses that empower smallholder farmers, such as food processing or preserving; iii) Energising Schools Feeding transformative solutions that turn schools into sustainable energy hubs that power solutions for children and surrounding communities. Urgent and large-scale solutions are required to address the widening energy access gap impacting vulnerable and displaced populations in particular in Africa, and improve access to clean energy in a complex crisis.
WHY IS IT NEEDED?	Clean Energy is a key solution aligned with climate-resilient development pathways. Universal access to clean, modern cooking solutions, and for productive uses of energy: i.e. production, processing, preservation are critical for resilient food systems. Currently, three billion people lack access to modern cooking solutions. These solutions will replace the use of polluting biomass, reduce cooking emissions, reduce deforestation (and thus mitigate mud slides, land degradation and desertification), and improve public health via reduced indoor air pollution. Currently, four million deaths each year are attributable to indoor air pollution. Further, modern cooking reduces fuel costs and the time burden of cooking which allows particularly women to increase income, with subsequent improvements in economic resilience and ability to invest in other resilience infrastructure. The importance of having access to modern forms of energy does not stop at food consumption but affects the entirety of Food Systems. Mechanised labour improves the quantity and quality of food produced and processed. Solar water pumps enable irrigation while solar mills substitute diesel generators that depend on expensive fuel and have high maintenance costs. In addition, preserving food by chilling, smoking, drying, pasteurising, dehydrating, vacuum sealing (all processes that require energy) substantially cuts the amount of food that is spoiled and wasted. In areas with complex crisis such as in Sub-Saharan Africa it is necessary to deliver clean energy to over 9 million displaced and associated host persons through an accelerated solar deployment. An estimated $500 million to $600 million of investment is required towards 2030 to deliver clean energy access to 4.5 million displaced and 4.5 million host persons

WHY WILL IT WORK?	Coordinating with the WHO Manifesto will elevate food system resilience in the work to build back better, allow resource pooling, and allow identification of synergies and anticipation of trade-offs with other global efforts. The food system is one of many systems – other being transportation, energy, economic and political systems – and coordination among systems is essential for effective governance (HLPE 2020). The UN WFP has already demonstrated that efforts to increase access to clean, modern cooking can succeed. This solution can build upon WFP's learnings via its *Increasing Access to Modern Cooking for Vulnerable Population*, *Energising School Feeding* and *Empowering Smallholder Farmers* initiatives. Working with and scaling up existing initiatives will ensure that context-specific information is considered, allowing context specific clean cooking solutions.
HOW WILL IT WORK?	A coalition of organizations at the intersection of health and climate change will drive forward advocacy to embed climate-resilient development pathways and food systems in WHO Manifesto efforts. Ultimately, the WHO Manifesto can leverage the trillions of dollars directed towards COVID-19 recovery packages to ensuring an inclusive, green, resilience future. Another innovative source of funding for the WHO Manifesto includes redirection of the USD $400 billion directed to fossil fuel subsidies each year. The achievement of clean, modern cooking can be scaled up by a consortium of organizations led by Rome based agencies, WFP, FAO and IFAD, and including financing institutions, governments and private sector actors. Specific tools that could be used include the latest technology to track and monitor stove location and usage, energy vouchers, and cash transfer. Among clean cooking solutions, electric pressure cooking (EPC) is highly effective. This solution will particularly target households, schools and productive facilities. The strategy for Energizing School Feeding is to strengthen local value chains and markets, enable increased livelihoods and economic growth, such that over time, schools and surrounding households can afford the services offered by private sector and decrease the need for public funding. Facilitating access to energy helps people, both during emergencies (to enable cooking, lighting and communications) and in fragile areas (where it can improve livelihoods, prevent shocks and build resilience). The transition to greened humanitarian operations could serve as a catalyst to accelerate the growth of the electrification of displaced and host communities, as initial concepts are proven and taken to scale in the latter half of the decade.

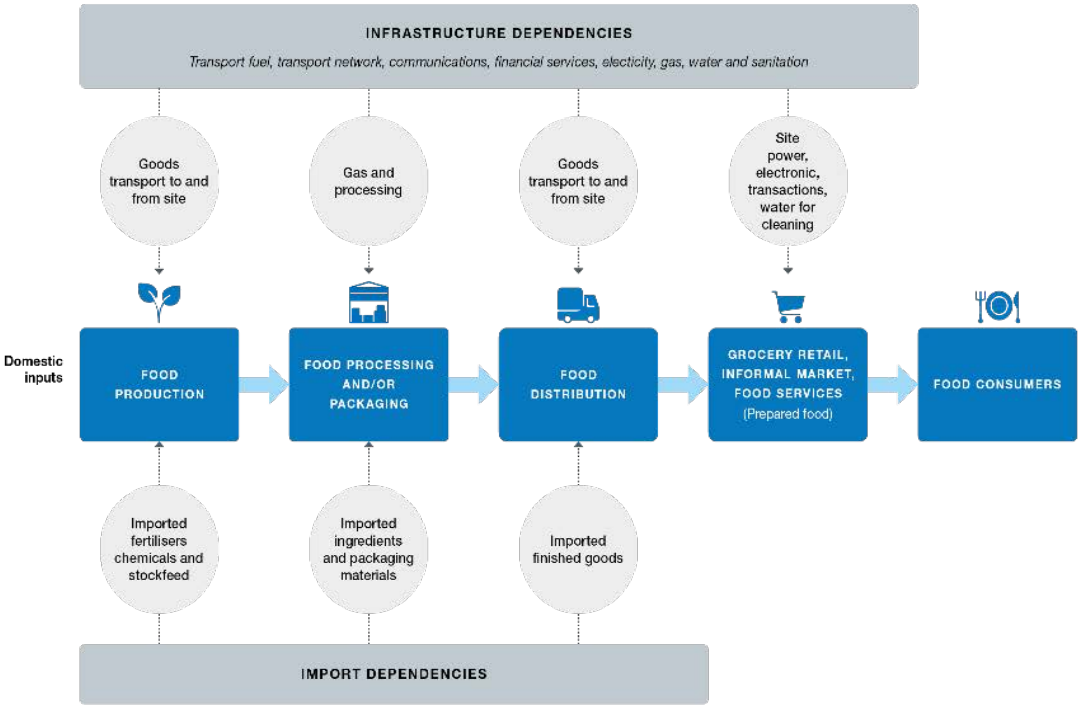
INDIVIDUAL SOLUTIONS PRIORITIZED IN WAVE 1 & WAVE 2	105	**Investing in climate-resilient development pathways for a healthy, green, inclusive recovery**. The Covid19 financial packages offer an opportunity to invest in climate-resilient development pathways that promote a healthy, green, inclusive recovery. A coalition will be formed to promote investments on a healthy, green and inclusive recovery, in line with the WHO Manifesto on a Healthy Recovery from COVID-19. Priority resilience actions include among other things, a healthy energy transition, and a transition into healthy diets from sustainable food systems. WHO manifesto's priority actions include divesting from fossil fuels and re-direct fossil fuel subsidies towards implementing priority actions of a green recovery.
	106	**Clean Energy for Food Systems' Resilience.** This includes universal access to clean (modern) cooking and productive uses of energy. Clean energy solutions are critical for human, household and community resilience in out-the-grid remote areas, fragile settings and to support humanitarian assistance efforts. Benefitting the 3 billion in the world who do not have access to modern energy cooking solutions in rural, urban and displacement settings, at the households, institutional and commercial levels. The adoption of modern cooking solutions would impact on the 4 M annual premature deaths, the deforestation rate, women's time, and conflicts between communities around scarce biomass resources. (WFP, FAO, IFAD).

POTENTIAL THEMATIC CLUSTERS TO BE FORMED

RISK PROOFING OF INFRASTRUCTURES ALONG THE FOOD VALUE CHAIN

THEORY OF CHANGE	If we manage interconnected and multiple risks and crises, from production to consumption, then we can build the resilience of food systems, so they transform from being part of the problem to becoming part of the solution, and can better sustain dealing with uncertainty. Systemic risk and crisis management requires investing at scale in a suite of complementary actions including ensuring that infrastructure is both resilient to shocks and that it is capable of building resilience of other systems.
WHAT IS THE IDEA ABOUT?	Food systems rely on critical infrastructure throughout, in the form of water, energy, and transportation, cold-chains, safety assurance, etc. Disruption to any part of any of these systems can cascade through to other parts of the supply chain and may lead to unexpected consequences. Resilient food system infrastructure is critical for production, processing, storage, distribution and waste management while processing facilities, transportation systems and energy systems are also integral parts of the infrastructure that move food from farm to fork. To date, however, there has been inadequate leadership, technical support and financing to ensure that infrastructure is resilient, especially along the food value chain. There are opportunities to reverse this trajectory. An estimated USD 94 trillion is expected to be invested in infrastructure globally in the next 25 years to sustain economic growth[35]. This offers a once in a lifetime opportunity to embed multi-risk reduction and resilience measures into infrastructure development, safeguarding essential systems, including those related to livelihoods, food security and agriculture.
WHY IS IT NEEDED?	Food systems have always been vulnerable to disaster and climate-related hazards with the agricultural sector often the most heavily impacted by disasters. In the face of climate change and in an increasingly inter-connected world with multiple, cascading risks, it is urgent to examine food system vulnerabilities and work to ameliorate them. Resilient infrastructure plays both a direct and indirect role in helping communities withstand the impact of shocks and stresses that affect food systems. At a macro-level, physical infrastructure underpins the achievement of all 17 Sustainable Development Goals (SDGs), including those most related to food systems resilience. Systematic risk proofing of new infrastructure investments to withstand the physical impacts of climate variability and disaster risks will not only avoid future damages and losses but can also play an essential role in building resilience to climate and disaster-related impact.

[35] https://outlook.gihub.org/



Critical infrastructure supporting transport, power, telecommunication, and water supply are essential for quality of life and livelihoods. Yet recent disasters indicate that up to 66% of total public sector losses in weather and climate-related extreme events are related to infrastructure damage[36]. Unsafe and risk-blind physical and social infrastructure that is exposed to shocks and stresses can cause severe consequences for people and economic activities, disrupting supply chains and food distribution. Furthermore, degraded infrastructure systems worsen the impacts of future climate and disaster risks.

WHY WILL IT WORK?	According to the World Bank, the net benefit on average of investing in more resilient infrastructure in low- and middle-income countries would be $4.2 trillion with $4 in benefit for each $1 invested[37]. Appropriate funding and financing for infrastructure planning, construction, and maintenance can yield multiple resilience dividends. The emphasis is not just spending more, but rather spending better. Investing in regulations, planning, and maintenance of infrastructure can significantly outweigh the costs of repairs or reconstruction after a disaster strikes. If these investments take place now, entire systems, including those underpinning the food sector, will be far better able to withstand the impact of a rapidly changing climate.
HOW WILL IT WORK?	Governments and partners have already started to form partnerships for action on resilient infrastructure. The Coalition for Disaster Resilient Infrastructure (CDRI) was launched in 2020 under the leadership of Government of India. This coalition is a global partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions that aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development. CDRI promotes rapid development of resilient infrastructure to respond to the Sustainable Development Goals' imperatives of expanding universal access to basic services, enabling prosperity and decent work. Its priority areas focus on providing technical support, research and advocacy. Although CDRI does not explicitly address food systems resilience, it is supporting the resilience of some of the most

[36] https://www.cdri.world/sites/default/files/publication/CDRI_Brochure.pdf
[37] World Bank. "Lifelines: The Resilient Infrastructure Opportunity" (https://openknowledge.worldbank.org/handle/10986/31805)

	critical sectors that affect food systems, including energy and transportation. The Coalition can provide an example of how to extend further consideration of resilient infrastructure along the food value chain as part of building resilient food systems while its members could be harnessed to support this endeavour.
INDICATIVE SOLUTIONS	This important area of work in building the resilience of food systems was identified as a gap by the cluster leads and is proposed as an additional Thematic Cluster. To date, no solutions proposed by Member States make explicit reference to this theme. UNDRR and FAO are committed to fill this gap to bring in such needed thematic coalition on resilient food value chain infrastructures.

CLIMATE JUSTICE (TBC)

XXX

ACTION AREA ON GOVERNANCE

ACTION AREA 6.1: GOVERNACE CROSS-CUTTING ACTION AREA ACROSS ALL ACTION TRACKS

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Governance, across local and national levels has been identified as a cross-cutting action area—one that relates to many of the cluster solutions put forward by the five Action Tracks. The Governance Action Area includes two main areas of focus: 1) Food System Summit (FSS) governance and 2) Food systems' governance more broadly.

The first focus area aims to address questions and concerns around FSS participation, processes, transparency, and accountability, with an emphasis on areas for continuous improvement as the Summit process unfolds.

The second focus area will explore across the cluster solutions and across Action Tracks common issues to be addressed and opportunities related to food systems governance.

Recognizing existing discussions on governance among the Action Tracks' efforts to date, the food systems governance group will serve as a centralized space to continue those discussions in a targeted and holistic manner.

Game Changing Propositions from AT5

1. **Global Panel on Agriculture and Food Systems for Nutrition** (IPCC like body on food & food systems). (GLOPAN, Global Panel on Agriculture, Food Systems and Nutrition)
2. **Promote at national, regional and global level the use, adoption and adaptation of the CFS negotiated policy convergence products which all reflect the AT5 approach** (FAO, PSM-CFS)

1. Use of international agreements, previously negotiated in the Committee of World Food Security. Voluntary Guidelines negotiated in CFS: Governance of Land, Fisheries, Forestry and Food Systems. CFS Framework for Action for Food Security and Nutrition in Protracted Crises (FAO)

Game Changing Propositions from other ATs

1.20 Foster shared learning on Food System Transformation Pathways

2.1 Integrated Cross Sector Assessments and National Action Plans up to 2030

2.5 National Food System Action Hubs

2.7 Strengthening Accountability through mechanisms that empower governments and civil society to drive change and reward good corporate behaviour

3.12 Aligning policies with nature-positive production
nature-negative production practices at the regional, national and sub-national levels.

3.20 Shifting the way stakeholders engage with evidence to enhance food system decision making

3.21 Strengthening Landscape Partnerships

SOLUTIONS THAT CAN BE TRANSFERRED TO OTHER TRACKS

1.Reducing food loss and waste and increasing productive use of commonly wasted materials through a portfolio of actions
Platform for Accelerating the Circular Economy (PACE) Circular Economy Action Agenda for Food (https://pacecircular.org/action-agenda/food)
https://docs.google.com/document/d/16-o-79R_j8E5scuh2_V6GR1fFdfU_QQa/edit

2. **Risk of malnutrition among children under 2 years of age.** Ensure that governments have national preparedness and emergency response plans that follow the Operational Guidance for Emergency Relief Staff and Programme Managers on Infant and Young Child Feeding in Emergencies which includes the protection, promotion, and support of infant and young child feeding in emergencies (Emergency Nutrition Network, https://www.ennonline.net/)

3. The African Orphan Crops Consortium. The AOCC is the most comprehensive and integrated crop improvement initiative on the continent, focused on these key components: (1) developing DNA sequence information on 101 African orphan crops to underpin genetic improvement of these crops; (2) training and sustaining a cadre of African plant breeding scientists through the African Plant Breeding Academy (AfPBA); (3) genetically improving selected crops and trees; (4) extending the new varieties to farmers; (5) creating local seed industries; and (6) educating consumers to use these crops as a part of safe, affordable, nutritious foods for healthier and more sustainable diets.