



INITIATIVE ON
Fruit and Vegetables for
Sustainable Healthy Diets



CGIAR Initiative on Fruit and Vegetables for Sustainable Healthy Diets (FRESH)

ANNUAL TECHNICAL REPORT 2022



CGIAR Technical Reporting 2022

CGIAR Technical Reporting has been developed in alignment with the [CGIAR Technical Reporting Arrangement](#).

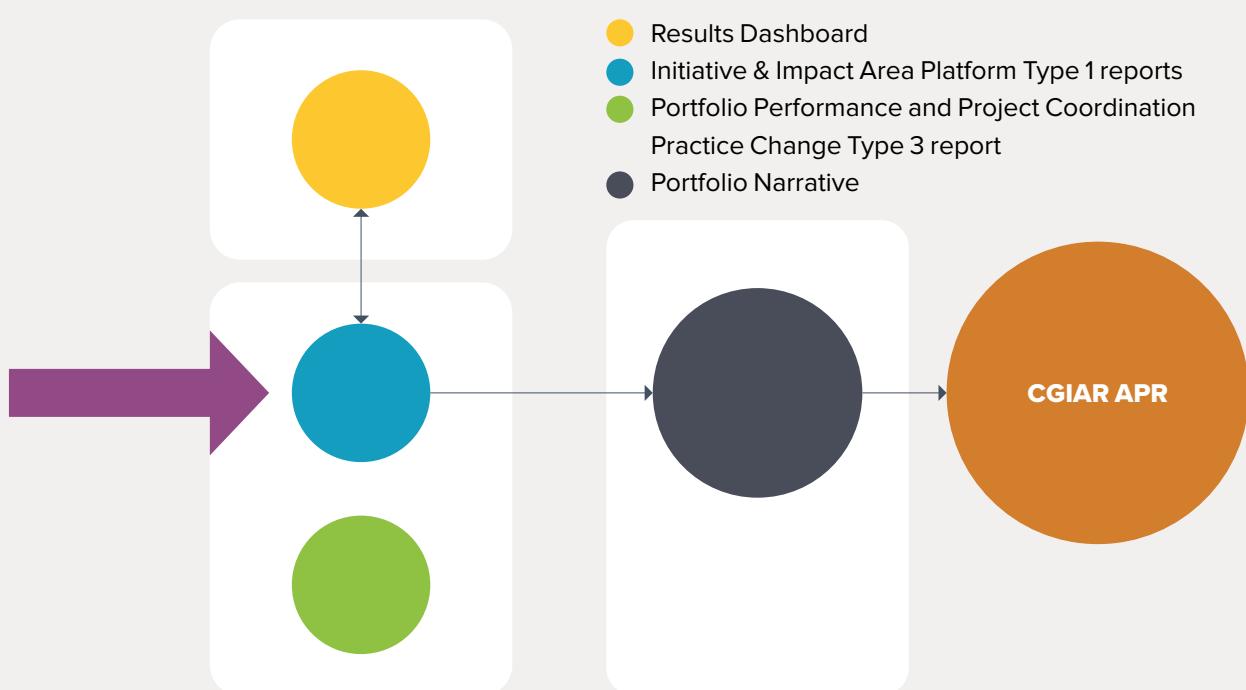
This Initiative report is a Type 1 report and constitutes part of the broader CGIAR Technical Report. Each CGIAR Initiative submits an annual Type 1 report, which provides assurance on Initiative-level progress towards End of Initiative outcomes.

The CGIAR Technical Report comprises:

- Type 1 Initiative and Impact Area Platform reports, with quality assured results reported by Initiatives and Platforms available on the CGIAR Results Dashboard.

- The Type 3 Portfolio Performance and Project Coordination Practice Change report, which focuses on internal practice change.
- The Portfolio Narrative, which draws on the Type 1 and Type 3 reports, and the CGIAR Results Dashboard, to provide a broader view on portfolio coherence, including results, partnerships, country and regional engagement, and synergies among the portfolio's constituent parts.

The CGIAR Technical Report constitutes a key component of the CGIAR Annual Performance Report (APR).



US\$	2022	2023	2024
Proposal Budget from initial submission	US\$4,999,335	US\$6,635,822	US\$9,363,785
Approved 2022 Budget	US\$6,967,095		

2022 Disbursement Target based on Approved FinPlan

Section 1 Fact sheet

Initiative name		Fruit and Vegetables for Sustainable Healthy Diets
Action Area		Systems Transformation
Geographic scope		Countries targeted in the proposal: Benin; Philippines; Sri Lanka; Tanzania, United Republic Countries with results reported in 2022: Benin; Philippines; Sri Lanka; Tanzania, United Republic Countries with legacy results reported in 2022: Ghana; Kenya; Nigeria
Start date		Apr. 1, 2022
End date		Mar. 31, 2025
Initiative Lead		Deanna Olney – d.olney@cgiar.org
Initiative Deputy		Ravi Gopal Singh – r.g.singh@cgiar.org
Measurable three-year End of Initiative outcomes (EOI-Os)		EOI-O 1: Key actors from government, multilateral organizations, and academia are actively engaged in designing and testing interventions to increase fruit and vegetable intake. EOI-O 2: Climate-resilient F&V adoption At least 10,000 farmers adopt improved climate-resilient vegetable cultivars across the four focus countries. EOI-O 3.1: Increased safe and sustainable production practices At least 10,000 farmers adopt safe and sustainable vegetable production practices across the four focus countries. EOI-O 3.2: Innovation use of optimized F&V production technology At least three innovation packages for improved efficiency and optimized synergies of resources in vegetable production systems adopted by farmers across the four focus countries. EOI-O 4: Post-harvest and food safety innovations At least 12 innovations for reducing post-harvest losses and/or improving food safety are piloted in at least four focus countries, and at least six of these are ready for scaling. EOI-O 5: Food environment At least four programs aimed at making fruits and vegetables more accessible and affordable use fruit and vegetable country profiles and evidenced-based guidance in their design. EOI-O 6.1: National-level F&V programs, regulations, laws or policies At least four national-level programs, regulations, laws, or policies across four countries prioritize fruits and vegetables. EOI-O 6.2: F&V web hub description Web-based fruit and vegetable knowledge hub collates and consolidates fruit and vegetable research.

OECD DAC Climate marker adaptation score*	Score 1: Significant: The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives — namely, climate mitigation, climate adaptation, and climate policy, even though it is not the principal focus of the activity.
OECD DAC Climate marker mitigation score*	Score 1: Significant: The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives — namely, climate mitigation, climate adaptation, and climate policy, even though it is not the principal focus of the activity.
OECD DAC Gender equity marker score*	Score 1A: Gender accommodative/aware: Gender equality is an objective, but not the main one. The Initiative/project includes at least two explicit gender-specific outputs and (adequate) funding and resources are available. Data and indicators are disaggregated by gender and analyzed to explain potential gender variations and inequalities.
Website link	https://www.cgiar.org/initiative/fruit-and-vegetables-for-sustainable-healthy-diets-fresh/

*The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC [Rio Markers for Climate](#) and the [gender equality policy marker](#). For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.
The CGIAR GENDER Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.
These scores are derived from [Initiative proposals](#), and refer to the score given to the Initiative overall based on their proposal.

Section 2 Initiative progress on science and towards End of Initiative outcomes



Overall summary of progress against the theory of change

The Fruit and Vegetable for Sustainable Healthy Diets (FRESH) Initiative is implemented by the Initiative Development Team Partners (herewith referred to as core partners): the International Food Policy Research Institute (IFPRI), the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), the International Maize and Wheat Improvement Center (CIMMYT), the International Potato Centre (CIP), the International Water Management Institute (IWMI), AfricaRice, the World Vegetable Centre (AVRDC), Applied Horticultural Research (AHR), Wageningen Economics and Research (WUR), Institute of Development Studies (IDS), the University of Sydney (USyd), and the University of California, Davis (UC Davis). This multi-disciplinary team has brought together their expertise to develop and test end-to-end approaches and components that address issues of desirability, affordability, availability, and accessibility of fruits and vegetables

Colombo Market
Photo credit: Quinn Marshall, IFPRI

(F&V) and strengthen the enabling environment. The overall goal of the Initiative is to increase F&V intake and subsequently improve diet quality, nutrition, and health outcomes while also improving livelihoods, empowering women and youth, and mitigating negative environmental impacts. These goals directly align to each of the five Impact Areas. The FRESH theory of change (TOC) (see the Initiative-level TOC diagram) was created based on the aforementioned overall goals and is being adapted within each country context.

To anchor the design of the end-to-end approach, organization of the Work Packages (WPs) was based on the High Level Panel of Experts Food Systems framework¹ to address the constraints across demand (one WP), supply (three WPs), and food environment (one WP) and a sixth addresses the enabling environment for F&V innovations, programs, and policies.

¹ Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. September 2017. HLPE Report 12. Page 26.



FRESH is guided by the principle that its innovative approach to designing, testing, and scaling up interventions along the F&V production–consumption continuum requires close collaboration with actors along that value chain as well as policymakers and program implementers that are in positions to address F&V desirability, affordability, availability, and acceptability constraints. This principle guided the design of the priority research areas in the four focus countries: Benin, the United Republic of Tanzania (herewith referred to as Tanzania), Sri Lanka, and the Philippines.

In line with FRESH's collaborative approach, engagement with focal country partners began in the inception phase and continued throughout 2022. All Work Packages coordinated consultations with stakeholders to create communication channels, identify partners, and elicit input into the design of research activities to ensure that the FRESH activities are contextualized by country and informed by national priorities. These iterative exchanges, which will continue throughout implementation, have confirmed many of the FRESH TOC assumptions and that identified outputs meet country demand.

In 2022, Work Package teams rolled out several new workstreams and leveraged ongoing activities across the focal countries that contributed to the

Figure 1: FRESH WPs will work across the fruit and vegetable production – consumption continuum.

Work Package-level outputs and will contribute to Work Package outcomes.

Desk reviews were conducted around F&V intake and associated diet, nutrition, and health issues (of focal countries) and effectiveness of demand-side approaches to increase F&V intake (global) (WP1); food environments related to F&V (focal countries) (WP5); the available genetic material of traditional African vegetables (WP2); post-harvest losses and food safety concerns of F&V value chains (focal countries) (WP4); as well as a review considering the overall F&V value chain (global) (WP6). These research products provide a deep understanding of the existing evidence and inform how FRESH can fill remaining gaps.

On-the-ground activities were successfully implemented in 2022. Several were anchored around the supply of F&Vs, and launched with support from core partners AVRDC, CIMMYT, and AHR in collaboration with the Tanzania Agricultural Research Institute (TARI) and University of Abomey-Calavi in Benin. This included the regeneration of newly collected seed of vegetable crops in Benin and neighboring countries, breeding trials of economically important cultivars carried out in Benin, and demonstration trials for traditional

vegetables in Tanzania ([WP2](#)); the launch of a formative research survey with formal and informal vegetable wholesalers and retailers in Tanzania ([WP4](#)); several capacity-sharing workshops for vegetable producers (including seed producers) ([WP2](#), [WP3](#)); and the establishment of production hubs to serve as the participatory learning locations for trainings to improve safe and sustainable vegetable farming practices ([WP3](#)).

Three primary activities focused on consumers started in 2022. First, key stakeholder interviews within Benin, Sri Lanka, and Tanzania were conducted and results discussed at Work Package 1 stakeholder meetings to help inform the design of forthcoming consumer behavior research activities. Second, analysis of the dietary impacts of a nutrition-sensitive agriculture and social protection program was conducted, with findings shared at various workshops and conferences, and an additional follow-up survey implemented in early 2023 (in partnership with Wayamba University, Medical Research Institute, the World Food Programme (WFP), the Foundation for Health Promotion, and UC Davis) ([WP1](#)). Third, planning for large-scale surveys in Sri Lanka and Tanzania (with Wayamba University, University of Peradeniya, Sokoine University, and the FRESH core partners) that will be designed to capture the impact of the end-to-end approach (and its subcomponents) was initiated (cross-cutting WP with inputs from all WPs).

Related to the food environment ([WP5](#)), monthly monitoring of food availability and costs was conducted in partnership with the University of Peradeniya, and costs of F&V and the cost of a healthy diet were analyzed to understand the current issues and recent trends in Sri Lanka. The results from this were shared at the FRESH

External Advisory Group meeting, at the Sri Lanka FRESH launch, and at the FRESH Symposium held at the International Congress of Nutrition in December 2022. Planning was initiated for qualitative research to understand people's perceptions and experiences of food environments and further quantitative research in Benin, Tanzania, and Sri Lanka. Lastly, FRESH supported a workshop at the [Global Child Nutrition Forum](#) and brought together FRESH stakeholders working on promoting fresh fruits and vegetables in schools in Benin (AVRDC) and the Philippines (Ministry of Education and the International Institute of Rural Reconstruction) to share experiences and learning.²

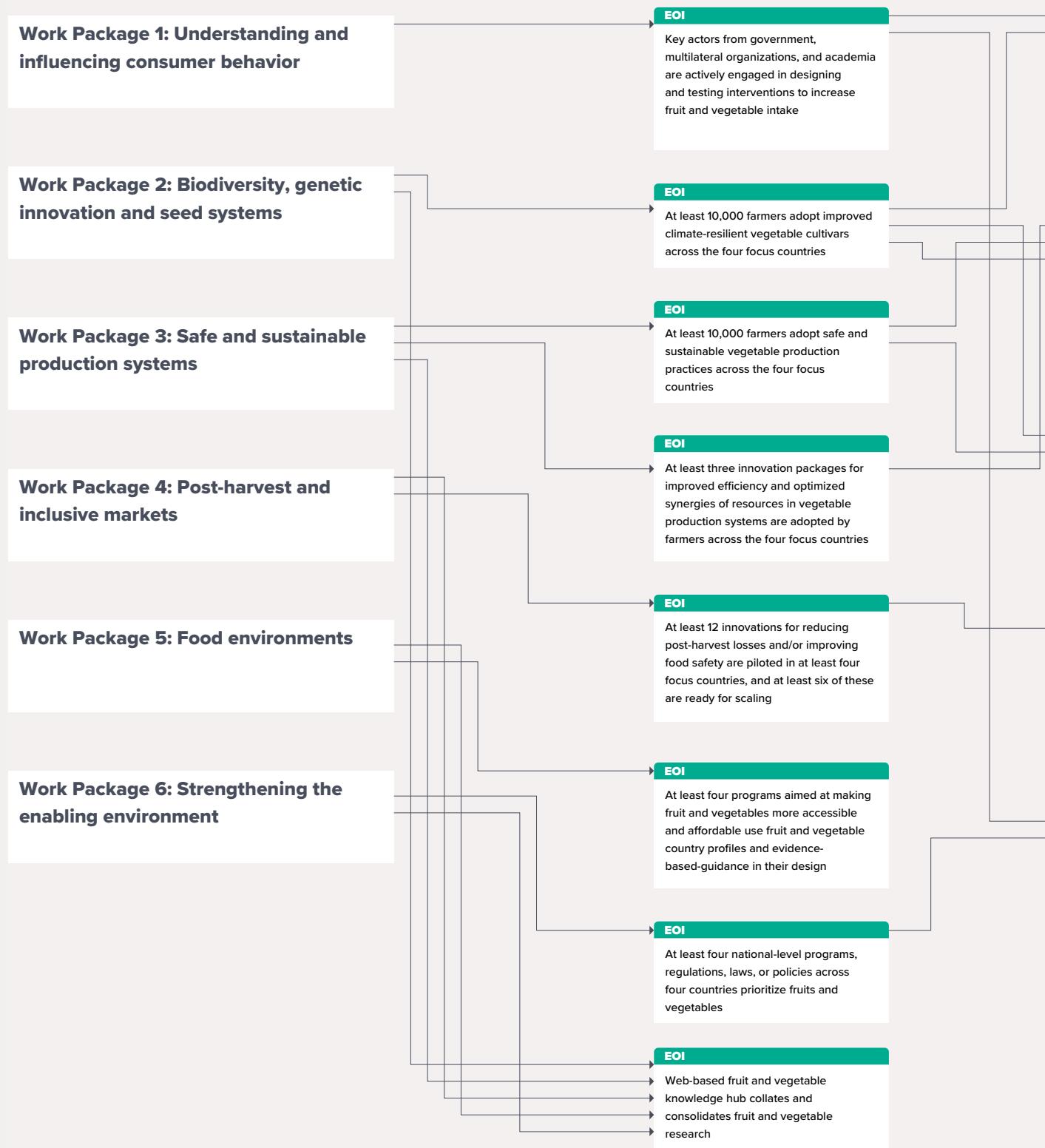
Both the internal coherence of the FRESH Work Package activities at country level and the external collaborations within each country are central to the success of the end-to-end approach and achieving both Work Package and End of Initiative outcomes. To strengthen internal coherence at country level, the country coordinators hold monthly internal FRESH meetings with representatives of each Work Package. To support external collaborations and the operationalization of FRESH, the country coordinators engage with a wide range of stakeholders within the country and regionally. See [Annex II](#) for more information on internal communication and adaptive management.

Despite the early successes of FRESH, several challenges, primarily related to delays in financing, hiring, contracting, etc., were encountered. Thankfully, our dedicated team worked well to mitigate these issues and focused on working on what they could while the administrative and finance issues were sorted out. Refer to [Annex I](#) for more details on the FRESH budgeting.

² The 23rd Annual Global Child Nutrition Forum Report. A report by the Global Child Nutrition Forum. March 2023. Page 25.

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives' theories of change are excluded for clarity.



EOI — End of Initiative outcome

AA — Action Area

IA — Impact Area

SDG — Sustainable Development Goal

 Nutrition, Health, and Food Security

 Poverty Reduction, Livelihoods, and Jobs

 Gender Equality, Youth, and Social Inclusion

 Climate Adaptation and Mitigation

 Environmental Health and Biodiversity

Teams from CGIAR's three Action Areas — System Transformation, Resilient Agrifood Systems and Genetic Innovation — worked to develop an improved set of Action Area outcomes in October 2022. Since this was near the end of the reporting cycle for 2022, it was decided not to update the theories of change based on these new Action Area outcomes. The exception to this is Genetic Innovation — for this Action Area, as the new outcomes had already been widely discussed among the relevant Initiatives, and with its advisory group of funders and other stakeholders, the decision was made to update their outcomes in time for the 2022 reporting cycle.



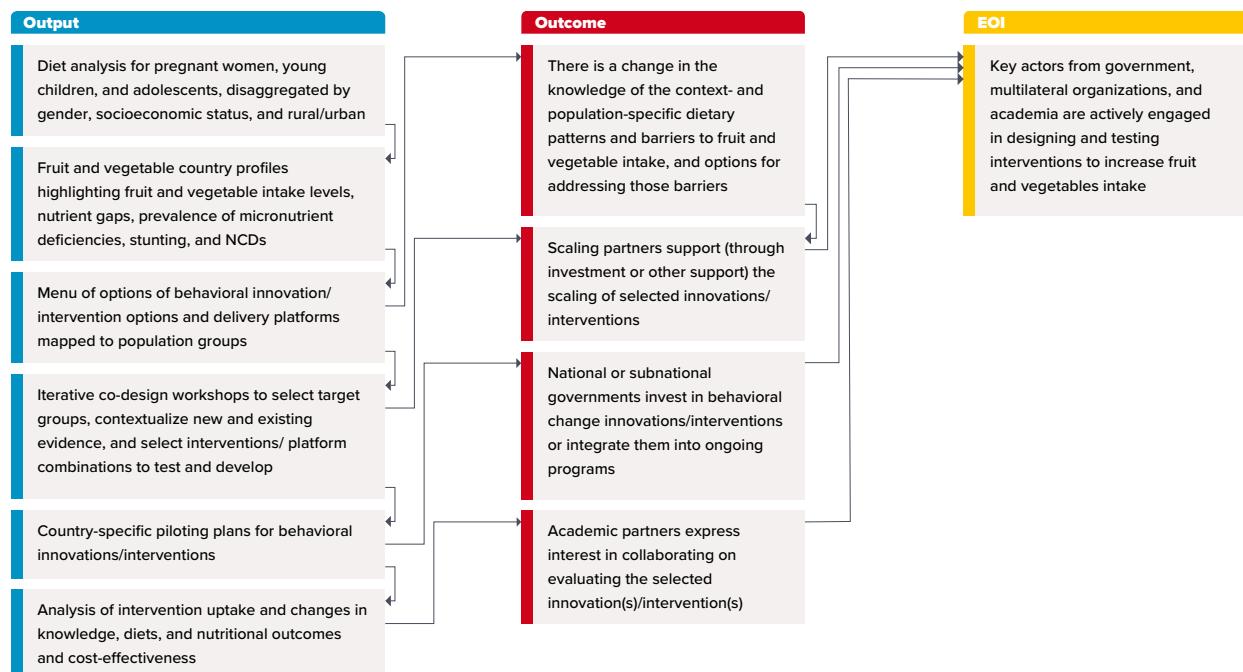
Progress by End of Initiative outcome

EOI-O 1	This is the EOI directly linked to WP1 outputs and outcomes, and progress toward this outcome is on track. In Tanzania, we are engaged with Sokoine University in the identification of potential demand-side interventions to test. In Sri Lanka, we have engaged with Wayamba University in the design and testing of demand-side interventions. In all countries, progress has been made across all six outputs and one outcome, putting us on track to achieve this EOI in all four countries.
EOI-O 2	This is the EOI directly linked to WP2 outputs and outcomes, and progress toward this outcome is on track. Newly collected seed of traditional vegetables was regenerated for long-term conservation in the AVRDC genebank. Breeding and demonstration trials are ongoing in two of the four countries. Work in Benin is advanced, leveraging past activities on and improvement of priority crops and improving seed systems. Iterative capacity-strengthening workshops for seed producers are ongoing, which will enhance their capacity for supplying seed of climate-resilient cultivars to farmers.
EOI-O 3.1	This is the EOI directly linked to WP3 outputs and outcomes, and progress toward this outcome is on track. Production hubs were established in three of the four countries to act as a participatory learning site where farmers may learn safe and sustainable production practices for locally adapted vegetable cultivars. 108 farmers were trained on best agricultural practices in Benin, including on integrated pest management (IPM). The production hub activities are expected to accelerate in 2023.
EOI-O 3.2	This is the EOI directly linked to WP3 outputs and outcomes, and progress toward this outcome is on track. Production hubs were established in three of the four countries. The ongoing constraints and opportunity analysis conducted in each country will inform selection of an optimized bundle of innovations — including methods and tools for improved sowing, fertilization, pest and disease management, and water management — in vegetable production systems.
EOI-O 4	This is the EOI directly linked to WP4 outputs and outcomes, and progress toward this outcome is on track. Areas for intervention around post-harvest losses and food safety were co-identified with research partners in each of the focus countries. These partners will help select and prioritize innovations to address post-harvest loss of food safety challenges.

EOI-O 5	<p>This is the EOI directly linked to WP5 outputs and outcomes, and progress toward this outcome is on track. A literature review of food environments has helped inform existing evidence gaps and potential solutions. Stakeholder consultations have identified partners for co-designing and implementing activities. In Sri Lanka, analyses of F&V availability and cost data have been conducted that can be used in the design of food environment and demand-side interventions.</p>
EOI-O 6.1	<p>This is the EOI directly linked to WP6 outputs and outcomes, and progress toward this outcome is on track. A policy matrix of F&V-related policies has mapped out regulations that would influence the F&V value chain. An evidence review of interventions to impact F&V affordability, accessibility, desirability, and availability is ongoing — this review will bring to light success stories that may be replicated and inform policy decisions. A policy engagement plan has been developed in Benin that can be used as a blueprint for other country contexts.</p>
EOI-O 6.2	<p>This is the EOI directly linked to the fruit and vegetable web-based hub. Progress against this outcome is delayed. The concept of the web-based hub is still under development. While the outputs that would be hosted on the web hub are still on track to be completed, how they would be curated on a web hub, and what organization would manage the web hub, is yet to be determined.</p>

Section 3 Work Package-specific progress

Work Package 1: Understanding and influencing consumer behavior



Work Package 1 progress against the theory of change

Good progress was made toward the intended outputs and outcomes by the core partners IFPRI, CIP, the Alliance of Bioversity International and CIAT, and UC Davis.

Three activities — including literature reviews related to dietary patterns, health, and nutrition issues; key informant interviews to understand the partners working in areas relevant to demand-creation, diets, nutrition, and health; and secondary data analysis of existing dietary data (output 1.1) across the focus countries — are contributing to the creation of diet and nutrition country profiles related to F&V intake (output 1.2).

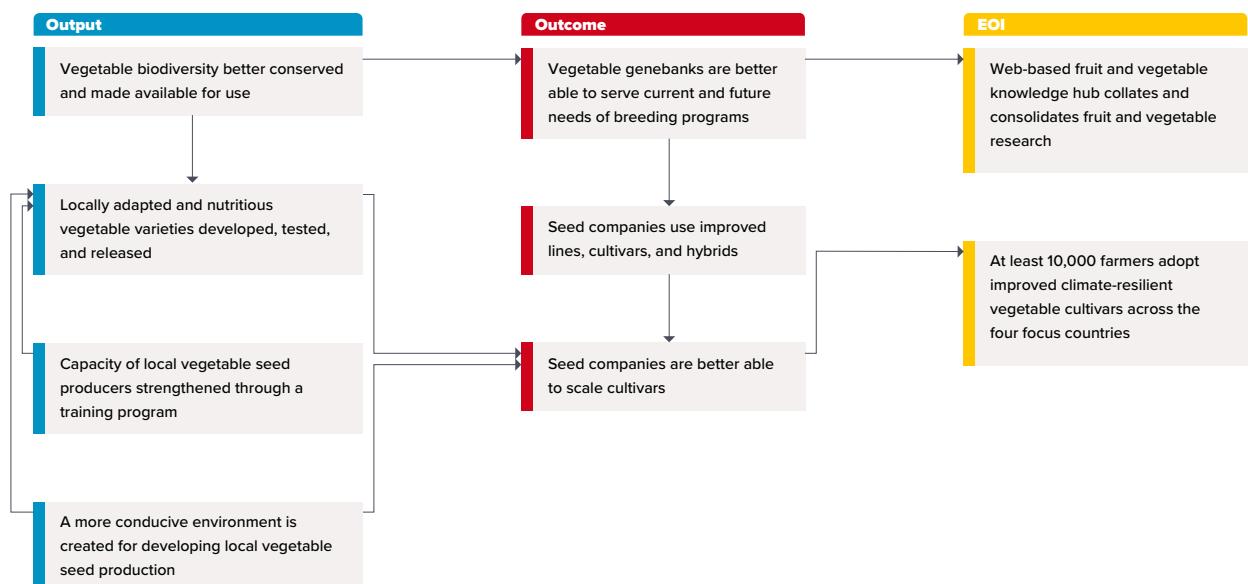
Progress was made toward creating a behavioral interventions menu of options (output 1.3). Above-mentioned activities and a review of the scientific evidence of interventions to increase F&V intake are contributing to this output. Piloting, evaluations, and analysis of existing data of

innovations (such as FRANI in Sri Lanka (output 1.5) and programs (such as the WFP's nutrition-sensitive Food Assistance for Assets Program in Sri Lanka (output 1.6)) and others implemented in phase one will provide additional insights.

Consultative workshops were held in Benin and Tanzania with key stakeholders to prioritize target groups as well as programmatic and research activities to improve F&V intake (output 1.4). Similar workshops are planned for Sri Lanka and the Philippines. These consultative groups are the first step in establishing a technical advisory group for each country that will participate in iterative exchanges (formal and informal) to support the demand-side activities and will help support the achievement of outcomes 1.1, 1.2, 1.3, and 1.4.

Work Package 1 established partnerships with Sokoine University (Tanzania), the University of Wayamba (Sri Lanka), and DOST-FNRI (Philippines). Engagement with these partners in the design and prioritization of the research activities (including in the consultations mentioned above) is in line with the achievement of intermediate outcome 1.4.

Work Package 2: Biodiversity, genetic innovation, and seed systems



Work Package 2 progress against the theory of change

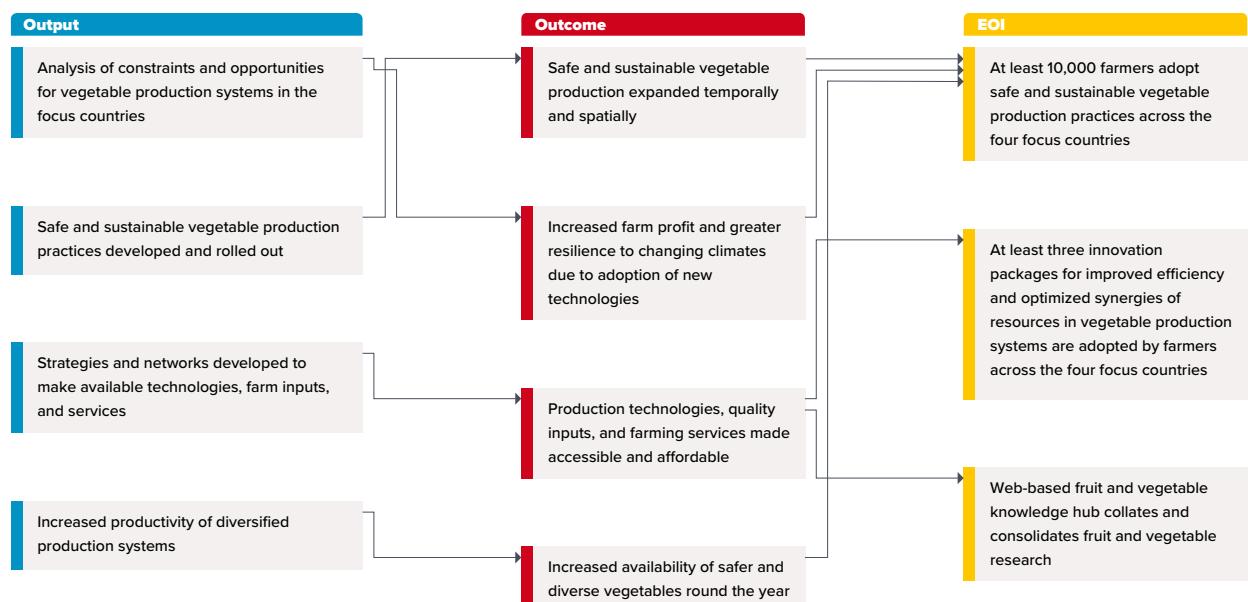
Work Package 2, led by AVRDC, leveraged ongoing work in Tanzania and Benin while building in-country partnerships and identifying opportunities for collaboration in Sri Lanka and the Philippines.

In Benin, ongoing seed-production capacity-sharing workshops were held, promoting best seed-production practices with vegetable seed producers (output 2.3). Work Package 2 contributed to the regeneration of traditional African vegetable seed accessions that were collected by the University Abomey Calavi and handed over to AVRDC for conservation (outputs 2.1 and 2.2). A [policy brief](#) was written to propose strategic actions for strengthening formal vegetable seed systems. This seed systems roadmap methodology involved a review of seed policy documents, individual consultations, and two workshops with stakeholders, presentations to the government,

and a review of the draft by a committee of seed systems experts (output 2.4). Seed systems analyses will be performed in Tanzania and Sri Lanka to guide interventions to improve equitable access to vegetable seed. These analyses contribute to outcomes 2.2 and 2.3.

In Tanzania, researchers are working to understand seed physiology and establish seed longevity equations for the most important traditional African vegetables to guide conservation (output 2.1). This work is contributing to Work Package outcome 2.1. Vegetable breeding trials were implemented in Benin and Tanzania, while collaboration contracts are finalized with public and private research and scaling partners in Sri Lanka and the Philippines for testing and scaling improved vegetable cultivars. For the Philippines, the Alliance of Bioversity International and CIAT is planning a study with the National Genebank and Lighthouse Schools to define priority traditional vegetables for biodiversity monitoring and rescue (output 2.1).

Work Package 3: Safe and sustainable production systems



Work Package 3 progress against the theory of change

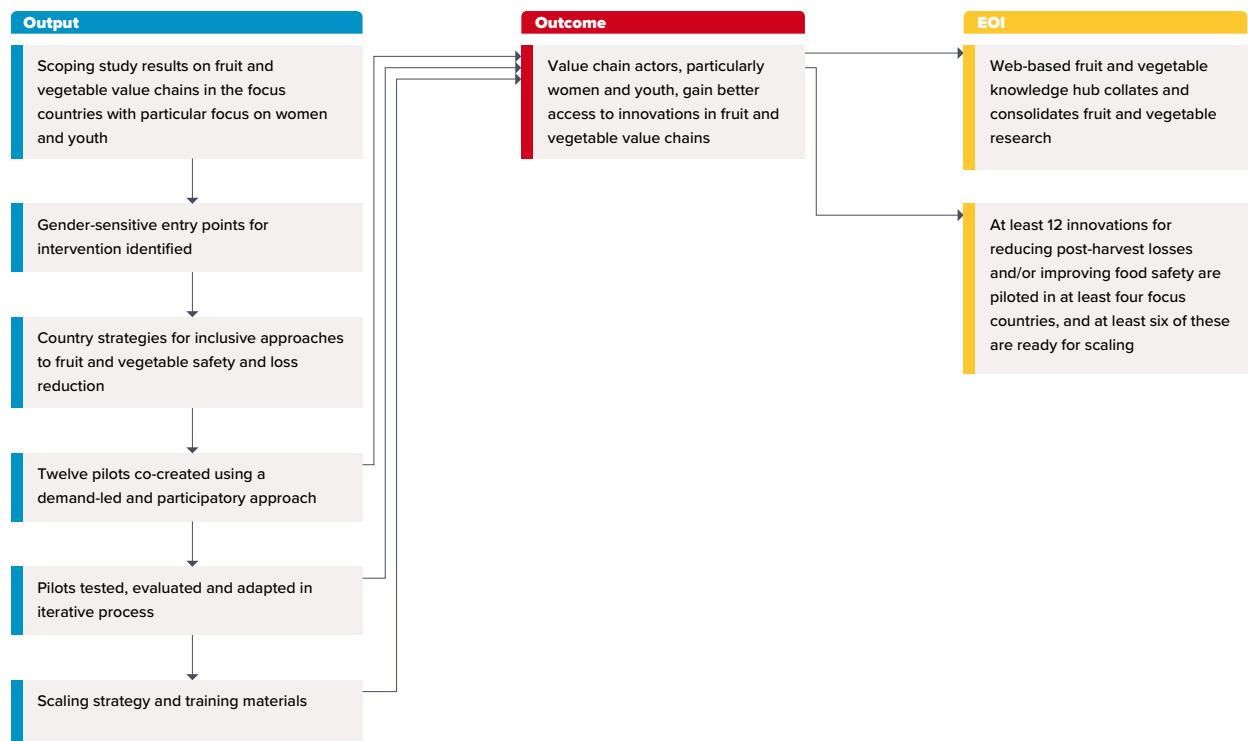
2022 began with a series of scoping studies to identify where Work Package 3, in collaboration with in-country partners, could establish production hubs. FRESH core partners CIMMYT and AVRDC collaborated to identify suitable agroecological zones, with support from the International Water Management Institute (IWMI) to identify potential irrigation and improved water management interventions.

Vegetable production hubs are a core innovation that anchors Work Package 3's approach, and the hub activities directly contribute to outputs 3.2, 3.3, and 3.4. Production hubs are a tested strategy for creating sustainable agrifood system innovations based on a network of stakeholders. The hub model emphasizes local context and actors, and focuses on the interaction and exchange of knowledge, technology, and information through participatory research. Hubs

have been established in Benin, Tanzania, and Sri Lanka, selected through a series of iterative workshops with in-country stakeholders and partners (output 3.2). The constraint and opportunity analyses for production systems has been completed in Benin and Tanzania and is ongoing in Sri Lanka (output 3.1).

In addition to the production hubs, capacity-sharing events have taken place to promote different location-specific agricultural practices. One involves a series of best agricultural practices for nursery establishment and management, with emphasis on sterilization of the seed-sowing medium against soil-borne pests; and another involves inter-cropping systems of yard long bean and maize. These trainings provide the basis for using the production hubs as a participatory research site where farmer networks can connect to improved technologies and farming practices. These trainings, and the expansion of knowledge-sharing networks, directly contribute to outcomes 3.1 and 3.3.

Work Package 4: Post-harvest and inclusive markets



Work Package 4 progress against the theory of change

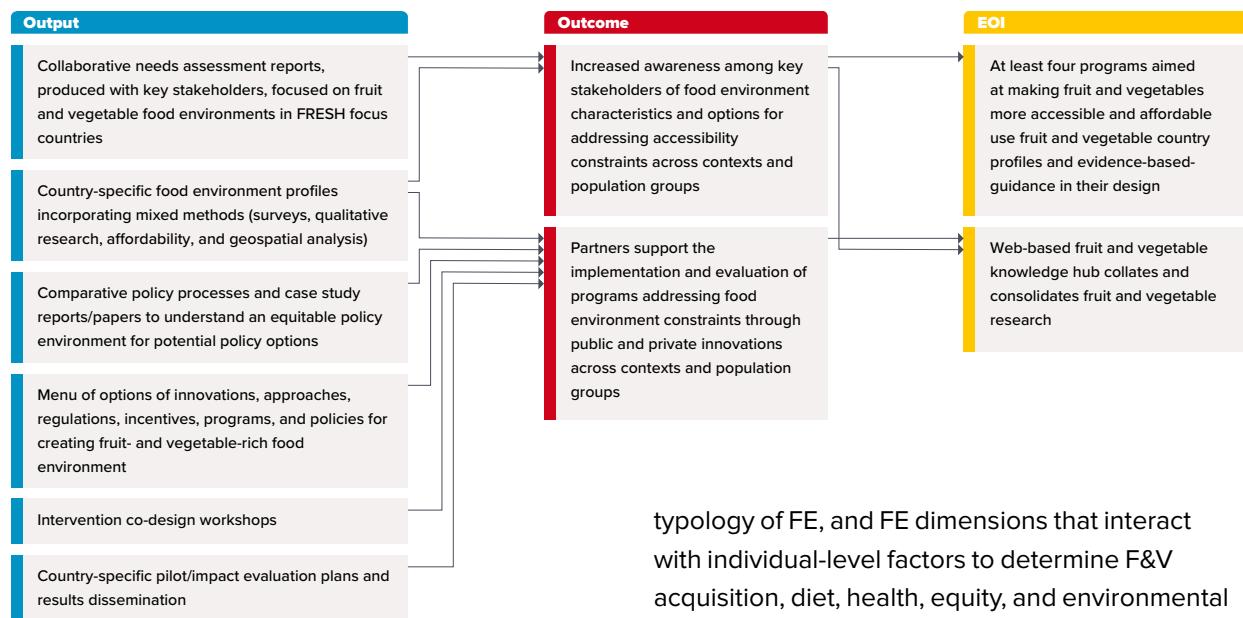
Work Package 4 took a standardized approach across FRESH core partners AHR, WUR, and USyd to understanding the F&V value chains in each focus country. The activities during this first year focused on answering the research questions: what are the main food safety risks; what is the extent of value chain losses and where do they occur; and what do we know about F&V value chain organization and governance?

To answer these questions, a series of literature reviews were conducted that directly contribute to output 4.1 and inform output 4.2. Five in-country partners, four led by women, were engaged to conduct literature reviews. These reviews have helped identify evidence gaps and areas for interventions on post-harvest losses, food safety,

and value chains in [Benin](#), [Sri Lanka](#), [Tanzania](#), and [the Philippines](#).

In Tanzania, a qualitative survey among informal retailers and wholesalers of F&V was conducted as a preliminary baseline to inform future in-country activities. This survey was followed by a quantitative survey, which resulted in the selection of 10 informal associations that will participate in future private-sector-led innovation pilots. In the Philippines, partners University of Philippines Los Banos and University of Philippines Mindanao conducted [loss assessments](#) of F&V in selected public markets and qualitative assessments from farm gate to retail for microbial and pesticide hazards. These research activities will help inform the design of future activities across FRESH focus countries, including outputs 4.4, 4.5, and 4.6, which are centered around the co-creation and scaling of post-harvest loss and food safety innovations.

Work Package 5: Food environments



Work Package 5 progress against the theory of change

Across FRESH core partners IFPRI, the Alliance of Bioversity International and CIAT, AVRDC, and IDS, Work Package 5 began by understanding the F&V food environments (FE) in each focus country and addressing the research questions: what evidence exists; what FE characteristics are central to F&V; and how do these characteristics vary by time and context for different people?

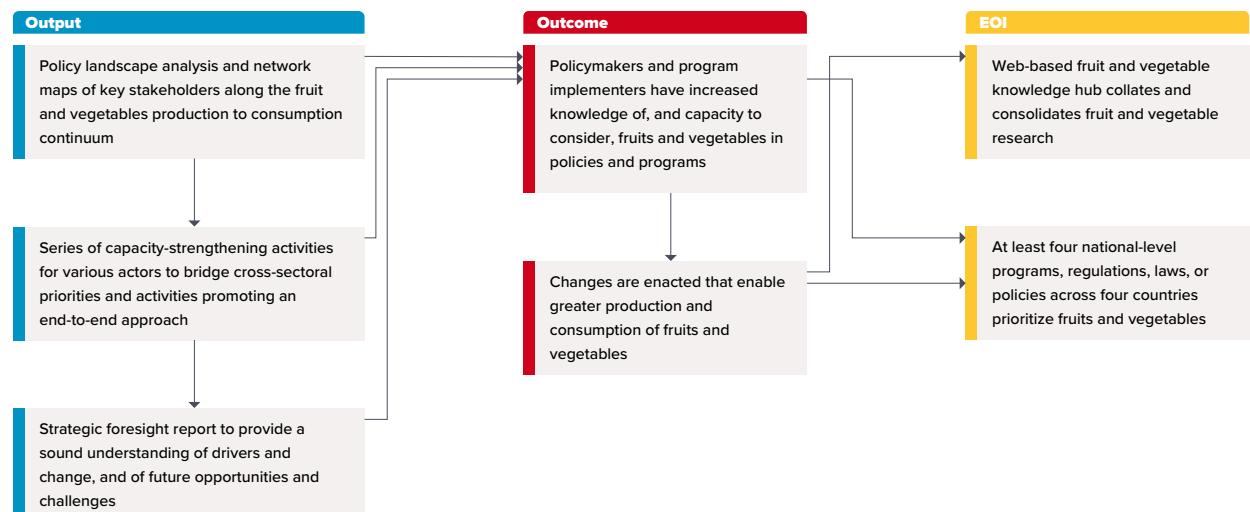
To understand the evidence base on F&V FE, researchers developed a standardized protocol for literature reviews to use across the focus countries. The researchers developed a framework, building on previous frameworks,¹ which proposes a

typology of FE, and FE dimensions that interact with individual-level factors to determine F&V acquisition, diet, health, equity, and environmental outcomes. In Benin and Sri Lanka, researchers are conducting participatory needs assessments and qualitative FE assessments, which will be replicated in Tanzania and the Philippines (output 5.1).

Relationships with in-country partners have contributed to the implementation of activities. For example, in collaboration with the WFP and the University of Peradeniya, FRESH is supporting monthly retail shop surveys to measure the cost of a recommended diet and track changes throughout the ongoing political and economic crisis. This research activity is contributing to output 5.2. Also in Sri Lanka, in partnership with Logic and the Colombo Urban Lab, researchers have designed an FE mixed-methods assessment (output 5.2) combining participatory mapping, collaborative needs assessment (output 5.1), in-depth interviews, and photographs to build a rich picture of experiences and interactions, opening discussions of how practices have changed during this period of economic crisis, and ultimately what this means for purchasing F&Vs. These approaches will help create country-specific FE profiles to inform future work (output 5.4).

¹ Turner et al. (2018). Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries, *Global Food Security*, Vol 18, pp93–101, ISSN 2211-9124, <https://doi.org/10.1016/j.gfs.2018.08.003>; Bogard, S.M. et al. (2021). A typology of food environments in the Pacific region and their relationship to diet quality in Solomon Islands. *Foods*, Vol 10, p2592. <https://doi.org/10.3390/foods1012592>; Downs, S.M. et al. (2020) A food environment typology: Advancing an expanded definition, framework, and methodological approach for improved characterization of wild, cultivated, and built food environments toward sustainable diets. *Foods*, Vol 9, p532. <https://doi.org/10.3390/foods9040532>.

Work Package 6: Strengthening the enabling environment



Work Package 6 progress against the theory of change

Work Package 6 core partners AVRDC and USyd were engaged in three workstreams: developing a policy matrix analysis and a policy engagement plan (output 6.1); conducting an end-to-end evidence review (output 6.3); and designing a foresight study (output 6.3).

For the first workstream, detailed matrixes describing policy actions relevant to each Work Package were completed. These policy data matrixes are based on a comprehensive analysis of relevant policy documents across sectors. The matrixes include relevant contextual information for each policy, including information on framing and content related to gender, nutrition, sustainable development, implementation, and resourcing. In each focus country, the policy research leads consulted with key stakeholders to ensure completeness of the analysis. As a result of this work, a policy brief per Work Package and focus

country was drafted. In addition, a policy engagement plan was created, building on broad policy research undertaken by researchers from AVRDC's SafeVeg project and the FRESH policy review.

For the second workstream, an end-to-end evidence review compiled available literature on interventions affecting intake, access, affordability, and availability of F&V to identify if and how interventions are connected. An initial screening has been completed and papers are now being analyzed for content.

The third workstream centered on designing a global foresight study of F&V in low- and middle-income countries. An initial study plan was prepared. The study will focus on key areas, including the future of breeding, future challenges to consumption, and the future of post-harvest losses.

Work related to output 6.2 on capacity-strengthening was delayed to 2023 due to hiring delays.

Work Package progress rating

WORK PACKAGE	TRAFFIC LIGHT / RATIONALE
1	 WP1 is on track and will accomplish the End of Initiative outcomes by the end of phase one.
2	 WP2 is on track and will accomplish the End of Initiative outcomes by the end of phase one.
3	 WP3 is on track to achieve its End of Initiative outcomes by the end of phase one.
4	 WP4 is on track to achieve the End of Initiative outcomes by the end of phase one.
5	 WP5 is on track to meet its End of Initiative outcomes within the life of the project.
6	 WP6 is on track to achieve its End of Initiative outcomes within the life of phase one of FRESH.

KEY

On track		<ul style="list-style-type: none"> Annual progress largely aligns with Plan of Results and Budget and Work Package theory of change Can include small deviations/issues/ delays/risks that do not jeopardise success of Work Package
Delayed		<ul style="list-style-type: none"> Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas Deviations/issues/delays/risks could jeopardise success of Work Package if not managed appropriately
Off track		<ul style="list-style-type: none"> Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas Deviations/issues/delays/risks do jeopardise success of Work Package

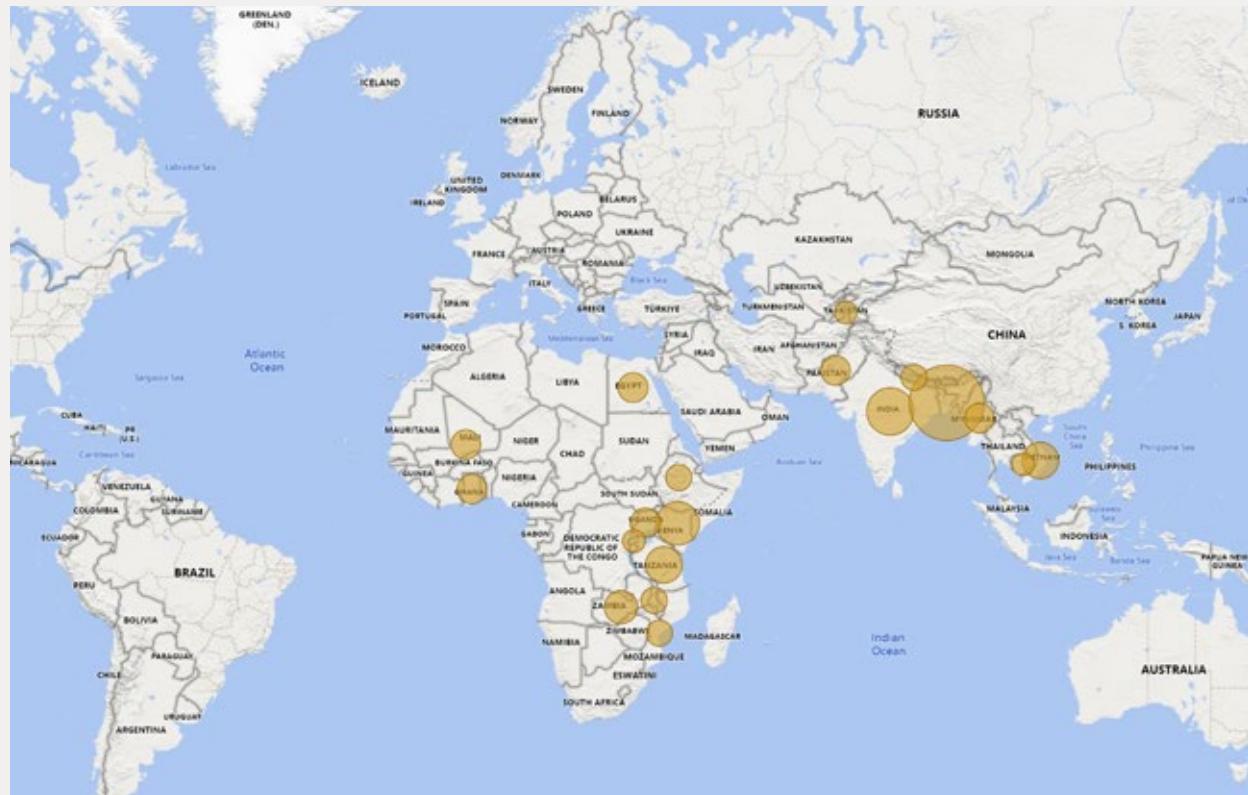
Peppers in Benin
Photo credit: World
Vegetable Center



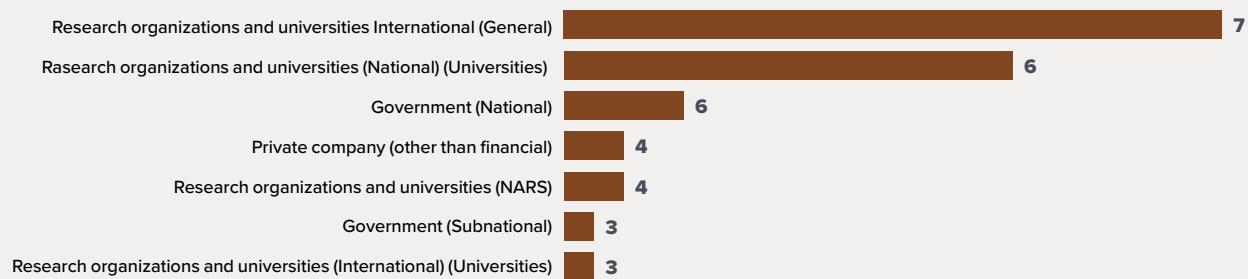
Section 4 Initiative key results

This section provides an overview of 2022 results reported by FRESH. These results align with the CGIAR Results Framework and FRESH's theory of change. Further information on these results is available through the [CGIAR Results Dashboard](#).

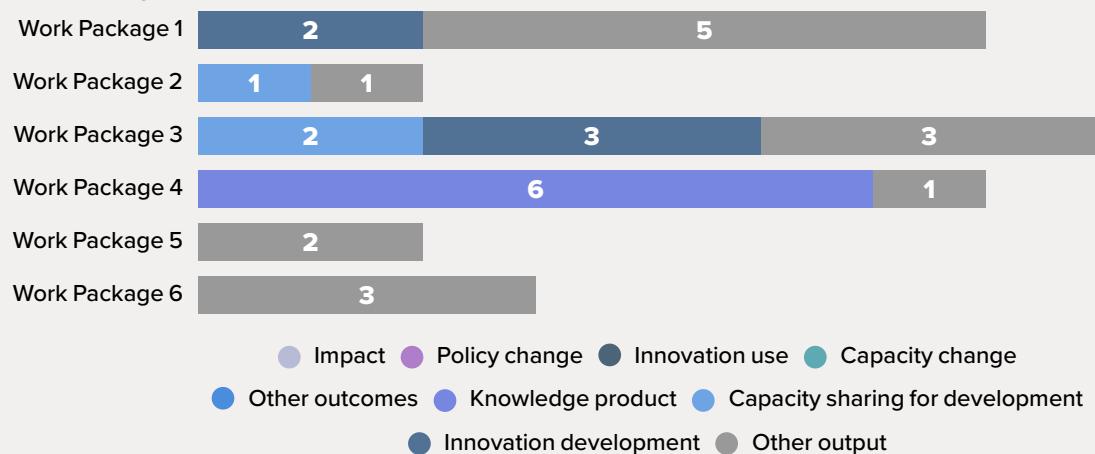
Results by country



Results by partner type



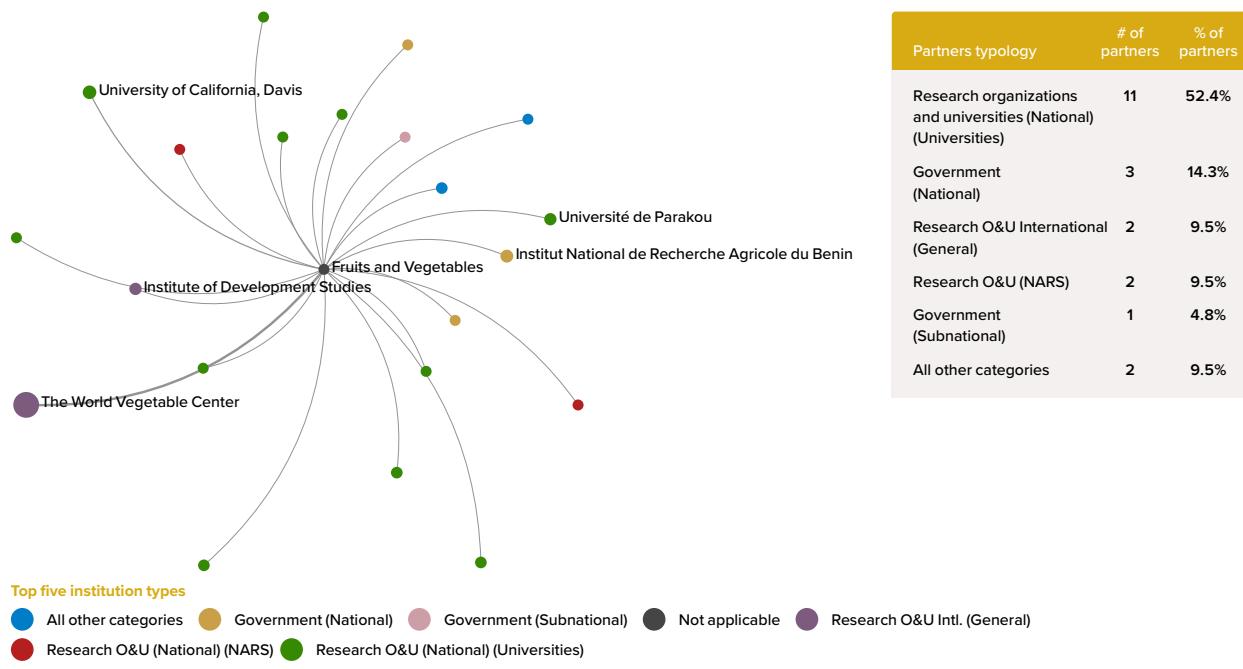
Results by Work Package



Innovations by readiness level



Section 5 Impact pathway integration – External partners



Partnerships and FRESH's impact pathways

There are 12 core FRESH partners that have been contributing to the design and implementation of the Initiative, some since the Initiative proposal development. Of these 12, 6 are not CGIAR Centers. As such, they are reflected as partners within the polynode graph above. While the mapping of non-CGIAR partners to results is valid, it does not accurately reflect the type of partnership in actuality. These core partners provide thought leadership, manage and implement research activities, in addition to forging and fostering local partnerships with demand, scaling, or research partners in each focus country. For example, AVRDC leveraged ongoing work under the SafeVeg and Choose Grow Thrive project, both of which have research objectives that contribute to the Climate Adaptation and Mitigation, Nutrition, Health, and Food Security, and Environmental Health and Biodiversity Impact Areas.

Local partnerships are a core component of the FRESH end-to-end approach and are key to the success of the Initiative's objectives. The end-to-end approach will be implemented across all countries, but emphasis across the F&V value chain will vary from country to country. The balance across the system is informed by an iterative and multi-layered stakeholder engagement process. Collaborations with research institutions and the private sector across all focus countries have driven the early successes of FRESH activities.

FRESH inception activities included mapping stakeholders across the F&V production–consumption continuum and bringing them together during the FRESH country launches. FRESH researchers undertook a variety of activities to engage local actors, including key informant interviews and scoping studies, with field visits to ongoing interventions carried out by scaling and research partners. In addition to informing the design of activities, partners are also essential to co-implementing and scaling activities. Refer to [Annex III](#) for additional information.

Section 6 Impact pathway integration – CGIAR portfolio linkages

Portfolio linkages and FRESH's impact pathways

FRESH has several new research workstreams that are co-led by 12 CGIAR and non-CGIAR partners. Because this is a new portfolio of research and an end-to-end approach was used, there was a concentrated effort to develop internal FRESH workplans and to identify and form partnerships. Across FRESH management, it was agreed that this short-term internal focus was critical to align resources and research activities across core partners to have more successful internal engagement across the wider CGIAR portfolio.

The demand and FE workstreams are led by IFPRI, CIP, and the Alliance of Bioversity International and CIAT, where there is a comparative advantage of technical expertise. This includes leveraging methods and innovations as developed under CGIAR Research Program A4NH and incorporating legacy products into FRESH research workstreams. In an effort to promote cohesion across Initiatives that are primarily contributing to the Impact Area Nutrition, Health, and Food Security, researchers from SHiFT, TAFFSA, and

Resilient Cities have discussed the use of similar tools and approaches for measuring diet intake and food environments so that metrics are uniform, which can support cross-country comparisons and analysis.

Safe and sustainable production workstreams are led by CIMMYT and IWMI, centers that share both their partnership networks and technical expertise for F&V production. IWMI researchers are the water management experts supporting Work Package 3; IWMI also anchors country coordination activities out of its headquarters in Sri Lanka. CIMMYT researchers spearheaded the design and establishment of the production hubs and provide expertise on dissemination and farmer outreach activities.

Consultations were held with the Rethinking Food Markets Initiative to explore how the work on F&V value chains under Work Package 4 in FRESH may be informed, or in turn inform, selected innovations for strengthening equitable value chains. Currently there is no geographic overlap, but opportunities for cross-learning may present themselves in future years.

Section 7 Adaptive management

To learn more about the FRESH team's adaptive management approach, please see [Annex II](#).

RECOMMENDATION	SUPPORTING RATIONALE
Strengthen internal communication practices.	To facilitate timely and transparent communication within and across FRESH WPs, FRESH management has implemented routine meetings within WPs and across WPs at country level. In addition, shared files capture monthly updates on research activities, events, and travel plans.
Country coordinators anchor country activities and strengthen external partnership relationships.	Country coordinators have been hired in Benin, Tanzania, and Sri Lanka, and have been identified for the Philippines. The country coordinators in Benin and Tanzania sit at AVRDC offices, and the third at the IWMI. In addition to fostering internal communication, the country coordinators play a critical role in identifying opportunities to strengthen FRESH activities through leveraging ongoing and future activities with CGIAR and external partner projects, and engaging with a wide range of stakeholders.
Make modifications to the outcome indicators in the theory of change (TOC).	Through a better understanding of the reporting processes and the actualization of workplans, a few changes have been made to the WP-level TOCs. The revisions are based on insights from work carried out in 2022, and the changes will allow for more accurate use of evidence (how to report what type of indicators) within the CGIAR reporting system. The science supporting the TOC pathways and End of Initiative outcomes remain the same.
Select Tanzania as the country where end-to-end evaluation will begin.	FRESH researchers are designing a robust evaluation to assess changes over time across the F&V value chain and to assess the impact of the supply, food environment, and demand-side approaches, and combined effects on the intake of F&Vs (and associated outputs and outcomes).
AfricaRice participation in FRESH Initiative will not extend into 2023.	Initially, one AfricaRice staff member served an advisory position for WP3. However, the alignment of the FRESH research activities and this staff member's availability and geographic focus led to an agreement between the AfricaRice researcher and WP3 to discontinue participation in 2023.
The IWMI will receive additional funding in 2023 to support the salary of IWMI staff (the FRESH Sri Lanka country coordinator).	The FRESH Initiative heavily relies on the effective coordination and management of its country coordinators to foster productive internal and external partnerships. To fulfil this critical function, a member of the WP3 team was identified for the role of country coordinator. As a result, the IWMI was allocated supplementary funds to support their work in this capacity.

COVER PHOTO: Sri Lanka Market.
Photo credit: Quinn Marshall, IFPRI



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