



INITIATIVE ON
Resilient Cities



CGIAR Research Initiative on **Resilient Cities**

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Disclaimers

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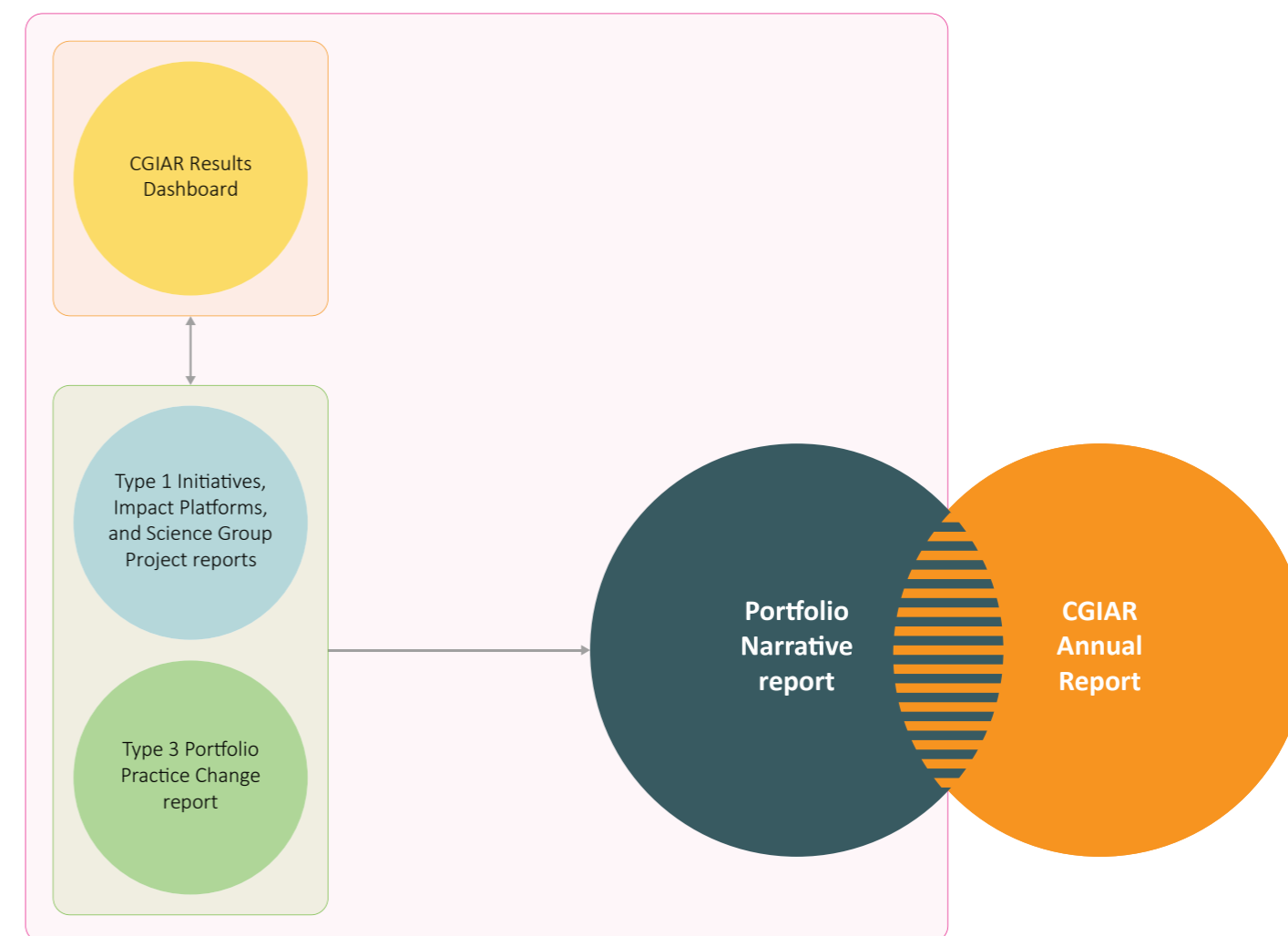
CGIAR Technical Reporting 2023

CGIAR Technical Reporting has been developed in alignment with the [CGIAR Technical Reporting Arrangement](#). This Initiative report (“Type 1” report) constitutes part of the broader [CGIAR Technical Report](#). Each CGIAR Research 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, Impact Platform, and Science Group Project (SGP) reports, with quality assured results reported by Initiatives, Platforms and SGPs 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 Annual Report is a comprehensive overview of CGIAR’s collective achievements, impact and strategic outlook, which draws significantly from the Technical Report products above. For 2023, the Annual Report and Technical Report will be presented online as an integrated product.



Section 1: Fact sheet and budget

Initiative name	Resilient Cities Through Sustainable Urban and Peri-Urban Agrifood Systems
Initiative short name	Resilient Cities
Initiative Lead	Simon Heck (s.heck@cgiar.org)
Initiative Co-lead	Silvia Alonso (s.alonso@cgiar.org)
Science Group	Resilient Agrifood Systems
Start – end date	01/04/2022 – 31/12/2024
Geographic scope	<p>Regions targeted in the proposal Central and West Asia and North Africa · East and Southern Africa · Latin America and the Caribbean · South Asia · Southeast Asia and the Pacific · West and Central Africa</p> <p>Countries targeted in the proposal: Bangladesh · Burkina Faso · Ethiopia · Ghana · Kenya · Peru · Philippines · Rwanda · Sri Lanka</p>
OECD DAC Climate marker adaptation score¹	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 score¹	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 score²	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/16-resilient-cities-through-sustainable-urban-and-peri-urban-agrifood-systems/

¹ 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.

² 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.

EXECUTIVE SUMMARY

In 2023, the CGIAR Research Initiative on Resilient Cities achieved significant progress in generating evidence, developing innovations, and building capacity to tackle the challenges faced by urban and peri-urban (UPU) food systems. Through strategic partnerships and close collaboration between several CGIAR Centers and Initiatives, Resilient Cities advanced in several critical areas. These include designing and testing innovations to enhance sustainable UPU food production, improve food safety in markets, and understand urban diets. The innovations pursue these changes by strengthening informal food markets, supporting entrepreneurs, and making reliable data available to decision-makers. The Initiative's work spanned various cities in three continents, including Accra, Addis Ababa, Colombo, Dhaka, Lima, Nairobi, and Quezon City in Manila, and was organized into five distinct Work Packages (WPs).

WP1 aimed at boosting production of nutritious vegetables in Dhaka, Manila, and Nairobi. Several demonstration plots to showcase the advantages of using healthy seedlings were established. The project also assessed the impact of an urban gardening training program that yielded positive outcomes for thousands of gardeners in these cities. It also explored innovative farming technologies such as hydroponics, aquaponics, and self-watering geobags, highlighting urban agriculture's potential to meet food security and nutritional needs in cities.

WP2 has initiated impactful projects in Lima, Nairobi, and Quezon City, to support informal vendors and farmers. In Nairobi and Quezon City, the Initiative trained 250 informal vendors to enhance their business skills and income. We are engaging with local governments and stakeholders in Bangladesh, Peru, and Viet Nam to garner interest for programs with potential benefits to vendors in low- and middle-income countries (LMICs). In Lima, a new strategy was implemented to connect farmers with institutional markets, targeting vulnerable communities by using otherwise wasted food. Efforts are ongoing to collaborate with local authorities and stakeholders to create policies that sustain and expand this innovative system. WP2 has engaged with the African Union to develop guidelines for African governments to engage with informal markets.

WP3 enhanced 20 compost stations in Sri Lanka to improve efficiency for the national Waste Management Authority. This effort will shape future capacity development programs and a monitoring dashboard. WP3 also published analyses on circular bioeconomy (CBE) solutions, sewage sludge reuse, and food waste strategies, notably reviewing Sri Lanka's failed shift to organic fertilizers. A significant achievement was contributing to the new water quality guidelines, "Water Quality in Agriculture: Risks and Risk Mitigation," published by the Food and Agriculture Organization of the United Nations (FAO) and soon available in Chinese. These guidelines aim to help various authorities and managers ensure safe water reuse, marking progress toward a sustainable CBE.

WP4's research on urban diets and food environments has advanced significantly through the development of the Urban Food Environment and Diets (UFED) toolkit and the execution of validation studies focused on nutrient intake assessments. In collaboration with the University of Ghana, WP2 successfully validated an artificial intelligence (AI)-powered phone application designed to measure nutrient intake among adolescents. The findings from this study were highlighted in a workshop that received national television coverage and were further disseminated through three published briefs. This work sets a solid foundation for guiding future research and informing policy decisions aimed at enhancing urban food environments and nutrition.

Through WP5, the Initiative provided training to 237 emerging scientists and entrepreneurs, sparking the launch of 15 innovative projects. In Ghana, the CBE Innovation Hub saw significant expansion, engaging more than 30 trainers and educating more than 6,400 students via targeted campaigns. Additionally, in Kenya, a collaborative effort with the Nairobi City County (NCC) led to the creation of a monitoring plan to oversee the advancement of Nairobi's Food System Strategy. This included field pre-testing of two key indicators, conducted with the involvement and guidance of NCC's food and agriculture extension officers. A notable collaboration with the World Bank culminated in the joint creation of a white paper on resilient urban food systems, which is anticipated for release in 2024.

Partnerships played a vital role in amplifying the Initiative's impact, enabling collaborative efforts with city governments, private sector entities, and international organizations. These collaborations were crucial for the co-development of monitoring plans, implementation of innovative business models, and advancement of strategies for urban food systems, showcasing the Initiative's commitment to collaborative and systemic change. In addition to collaboration with the African Union and FAO, the Initiative is cooperating with the World Bank to co-produce a white paper on resilient urban food systems. This paper underscores the significance of CGIAR and the Resilient Cities Initiative, highlighting their importance to major international organizations.

	2022	2023	2024
PROPOSAL BUDGET ▶	\$5.00	\$10.00	\$10.00
APPROVED BUDGET ¹ ▶	\$4.06	\$3.97 ²	\$2.98 ³

¹ The approved budget amounts correspond to the figures available for public access through the [Financing dashboard](#).

² This amount includes carry-over and commitments.

³ This amount is an estimation of the 2024 annual budget allocation, as of the end of March 2024.

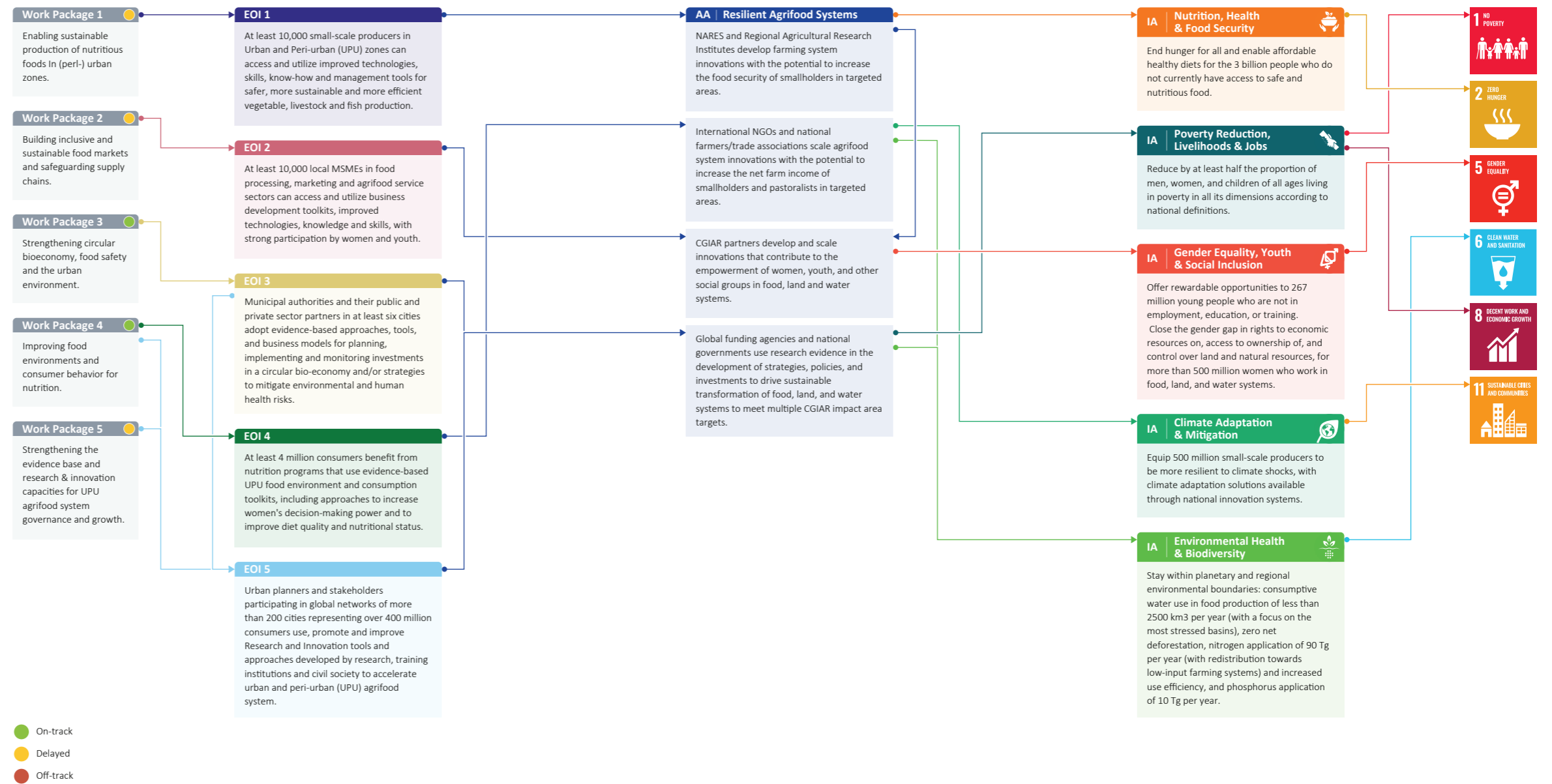


Mobile vegetable vendor in Dhaka, Bangladesh (2022). Credit: CGIAR

Section 2: Progress on science and towards End of Initiative outcomes

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

Note: A summary of Work Package progress ratings is provided in Section 3.



A community garden in Galille, San Jose Barangay, the Philippines. Credit: CGIAR

Progress by End of Initiative outcome

EOIO 1: Municipal authorities and their public and private sector partners in at least six cities adopt evidence-based approaches, tools, and business models for planning, implementing, and monitoring investments in a CBE and/or strategies to mitigate environmental and human health risks.

In WP3, the Initiative works through complementary impact pathways based on (1) advisory services, (2) capacity development, and (3) support of the resource recovery and reuse (RRR) investment climate. The most promising progress is reported from Sri Lanka where the Waste Management Authority will roll out new monitoring and evaluation (M&E) tools with advanced key performance indicators (developed under Resilient Cities) for 26 compost stations of three municipalities and more than 13 towns in Sri Lanka's most populated province.

EOIO 2: At least 10,000 local micro, small, and medium enterprises (MSMEs) in food processing, marketing, and agrifood service sectors can access and utilize business development toolkits, improved technologies, knowledge, and skills, with strong participation by women and youth.

The Initiative has developed a capacity-building program to enhance the entrepreneurial skills and food safety practices of small-scale vendors. In Manila and Nairobi, the program, at scale through partnership with government, could reach 10,000+ MSMEs, provided support will continue beyond 2024. The program is adaptable to other contexts, making it able to reach higher numbers. In Lima, the food rescue program to direct discarded food from farms to institutional markets could not only increase revenues for MSMEs but also enhance nutrition of vulnerable communities served by institutional markets.

EOIO 3: At least 10,000 small-scale producers in UPU zones can access and utilize improved technologies, skills, know-how, and management tools for safer, more sustainable, and more efficient vegetable, livestock, and fish production.

The new water quality guidelines adopted by FAO for crops, livestock, and fish farming, which will be translated into Chinese, are set to guide good agricultural practices for tens of thousands of UPU farmers using saline or unsafe water around the globe. This by far exceeds the Initiative's outreach target.

Moreover, situation analyses have been undertaken on various aspects of UPU production in three cities with more ongoing to enable informed decisions on delivery of improved technologies, strengthening capacity and engaging youth in safer, more productive UPU systems, including UPU vegetable and livestock keeping. Based on some of these scoping studies, improved technologies for vegetable production, revolving around high-quality seedling systems, are being evaluated with farmers, youth groups, commercial propagators, and tertiary education institutes for their impact, acceptability, and potential uptake, with good progress made.

EOIO 4: At least 4 million consumers benefit from nutrition programs that use evidence-based UPU food environment and consumption toolkits, including approaches to increase women's decision-making power and improve diet quality and nutritional status.

The UFED diet and food environment tool has been designed, with tool and indicator inventories and a prototype of the online tool which will be completed in 2024. This will be piloted by country partners and made available publicly online for implementers, policymakers, and other users. Scoping reviews in all eight focal countries were completed and will feed into urban country profiles. The profiles will provide comprehensive analyses of urban/rural nutrition and diets as well as literature on urban food environments, outlining challenges and evidence gaps for the public, researchers, and policymakers.

EOIO 5: Urban planners and stakeholders participating in global networks of more than 200 cities representing more than 400 million consumers use, promote, and improve research and innovation tools and approaches developed by research, training institutions, and civil society to accelerate UPU agrifood system.

The Initiative has strengthened its partnership with the World Bank, working together on a white paper focused on resilient urban food systems, set for 2024 publication. Aimed at World Bank decision-makers and broad city networks, this document offers strategic recommendations and investment options. Collaboration with the RUAF Global Partnership on Sustainable Urban Agriculture and Food Systems has enabled the profiling and analysis of urban food systems in cities like Lima and Nairobi, with findings shared with local municipalities. Through RUAF-funded articles in Urban Agriculture Magazine, communication about the Initiative's work has been extensively shared within relevant networks and organizations. Additionally, a collaborative effort with NCC led to the creation of a monitoring plan for Nairobi's Food System Strategy, involving field testing of key indicators by NCC officers. Agreements like the Memorandum of Understanding (MOU) with Quezon City and progress on MOUs with Lima and Nairobi exemplify the Initiative's growing network and its role in accelerating action in UPU food systems.

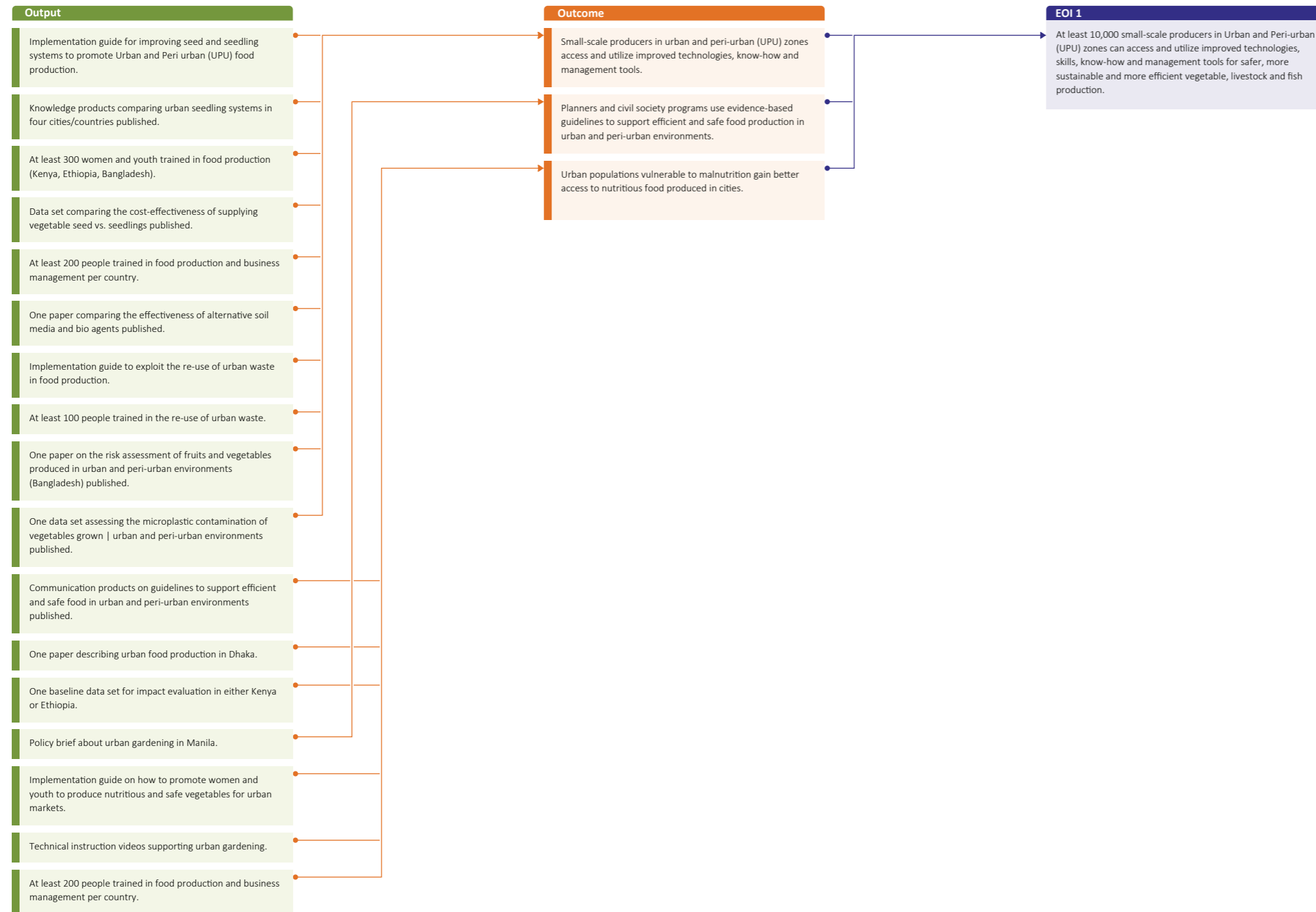


Vegetable farmers selling their produce in Hat Bazaar in Siraha district in Nepal. Credit: Nabin Baral / IWMI

Section 3: Work Package progress

WP1: Enabling sustainable production of nutritious foods in (peri-) urban zones

● Delayed



Work Package 1 progress against the theory of change

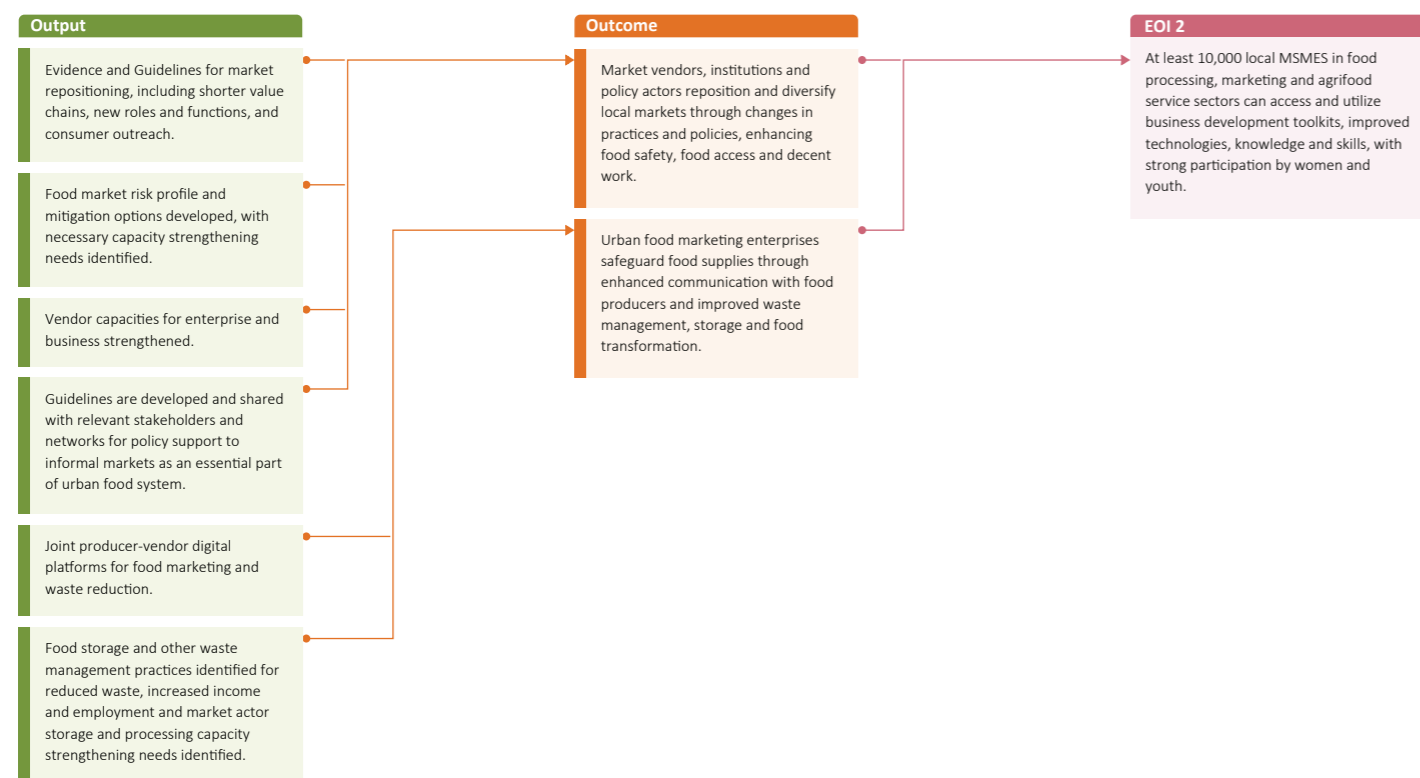
Activities were implemented primarily in Dhaka, Manila, and Nairobi, where the opportunities and challenges of UPU vegetable production were broadly analyzed. The use of healthy seed and seedlings in UPU settings was heavily promoted in WP1 to improve the safe production of nutritious vegetables. In Nairobi and Kisumu, Kenya, hundreds of demonstration plots were established with farmers to illustrate the benefits of using healthy seedlings. A highly diverse range of indigenous vegetables were distributed to urban gardens in Manila, and in Dhaka the impact of an FAO-led urban gardening training program involving thousands of urban gardeners was evaluated. Alternative technologies for growing vegetables on rooftops (such as hydroponics, aquaponics, and self-watering geobags) were also demonstrated and tested with urban gardeners in Dhaka and initiated with school vegetable gardens in Nairobi.

In Dhaka, urban gardening training had various positive effects on livelihood indicators, while the rooftop gardening alternatives were received with great enthusiasm. In Manila, we introduced 68 varieties of 31 types of indigenous food crops. In Kenya, healthy seedling demonstrations highlighted their multiple benefits, including higher levels of germination, transplant survival, and overall production, as well as lower pest and disease incidence. Links with seedling propagators were developed and a mobile app to improve access to seedling information and purchase is progressing well.

Studies on rooftop gardens in Dhaka showed that urban soils have poor soil microbiome diversity and vegetables are contaminated with several novel strains of antimicrobial resistant pathogens (*Citrobacter freundii*, *Shigella flexneri*, *Escherichia coli*), potentially posing a significant risk to human health. In a separate study, we analyzed the food safety risk of plastic pollution and found that common vegetables, such as water spinach and lettuce, can absorb and accumulate nano-sized polymer (plastic) particles.

WP2: Building inclusive and sustainable food markets and safeguarding supply chains

Delayed



Work Package 2 progress against the theory of change

In 2023, WP2 continued to operate at three levels: generate scientific evidence to guide the design of market interventions, pilot market and supply chain innovations, and engage with policymakers and stakeholders to make progress toward Initiative outcomes. The Initiative's budget reduction in 2023 required downscaling activities and refocusing one of the Initiative outcomes (solutions for food processing and storage). Progress continues toward the other outcomes.

The Initiative published assessments from Bangladesh and Peru investigating entry points to strengthen food safety in urban markets and inform the design of future interventions. It also implemented interventions in Lima, Nairobi, and Quezon City. The Initiative launched an entrepreneurship program for small-scale vendors. The pilot engaged 250 vendors in measuring the program's ability to improve their entrepreneurial practices and revenues. City

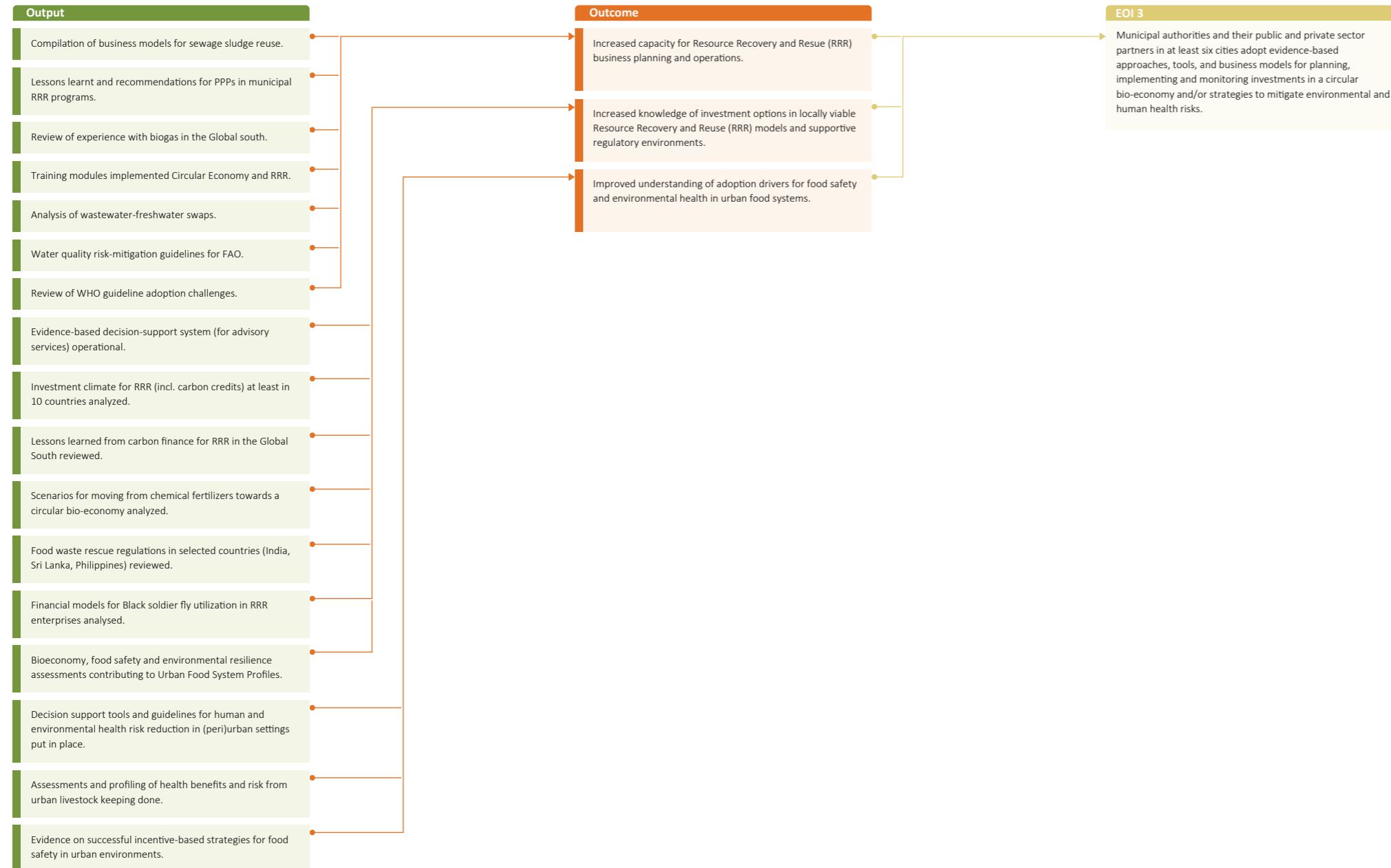
governments and local authorities in Nairobi and Quezon City have shown interest in scaling the program to the city level. Stakeholders in other countries (Bangladesh, Peru, and Viet Nam) see its potential to address one of the most pressing limitations on urban food systems—the lack of entrepreneurial and business capacity among small-scale vendors in LMICs. In Lima, we implemented an innovative approach to link farmers with institutional markets (“ollas communes” serving meals to vulnerable communities). It repurposes food discarded at the farm level for use in institutional markets. To enhance the innovation's sustainability and scalability, the Initiative is working with the municipal government and a local multistakeholder platform for a sustainable food system to develop local ordinances that will create a policy framework to institutionalize it. The Initiative has also supported the implementation of participatory guarantee systems to certify farmers' good practices, facilitating their ability to participate in government food procurement processes.



Dried fish at the weekly market of Yanonge- DRC.
Credit: Axel Fassio/CIFOR

WP3: Strengthening circular bioeconomy, food safety, and the urban environment

On track



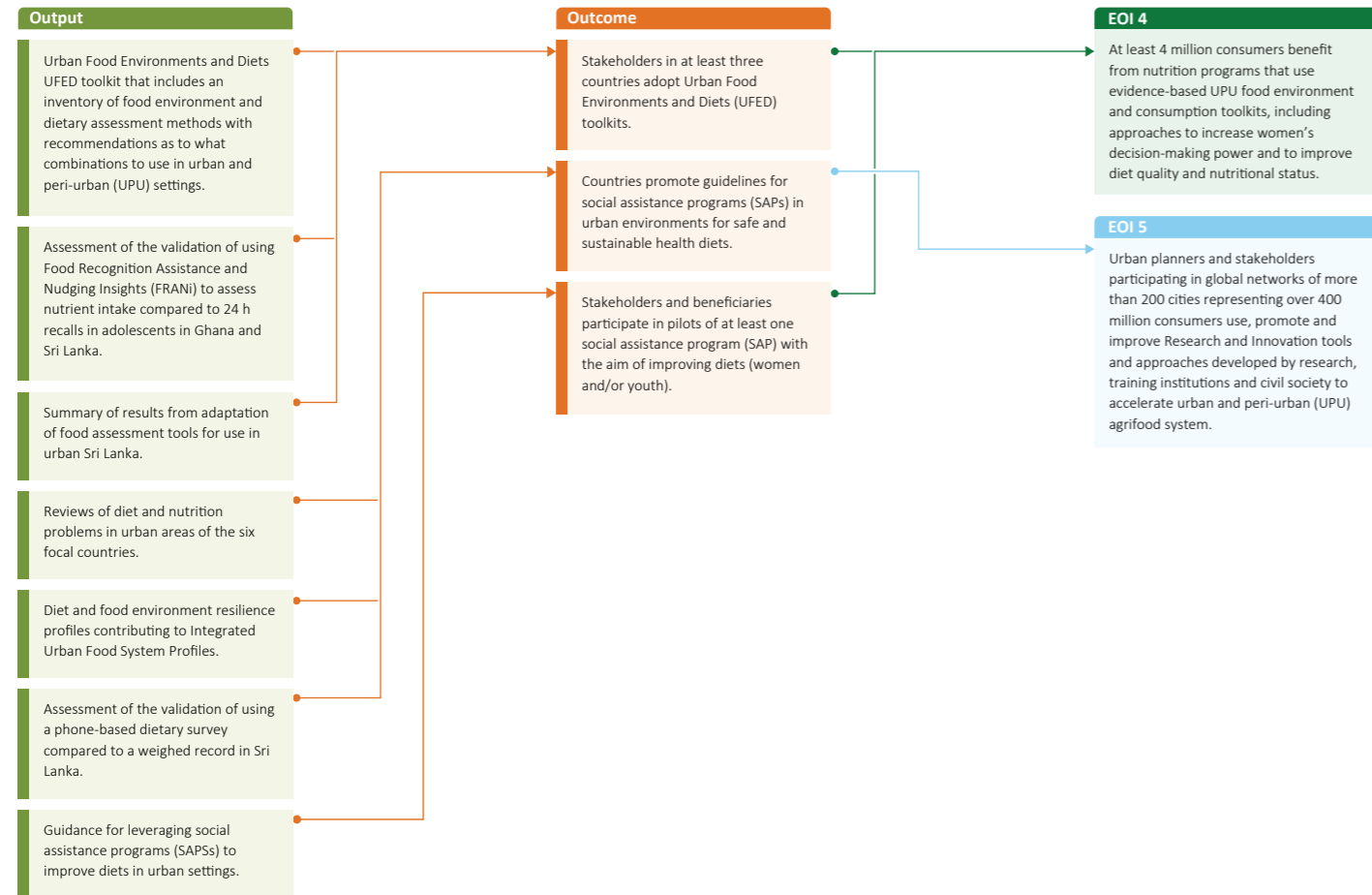
Work Package 3 progress against the theory of change

In 2023, WP’s key output was our contribution to the new FAO water quality guidelines, *Water Quality in Agriculture: Risks and Risk Mitigation*, which will soon be translated into Chinese. These guidelines will reach far more farmers than the target set by the Initiative. For example, 30 million ha are currently under raw or diluted wastewater irrigation and 20 percent of global irrigated areas suffer from saline irrigation water. The guidelines are intended for use by national and subnational government authorities, farm and project managers, extension officers, and engineers to evaluate water quality data and ensure safe water reuse—a major step toward greater CBE in practice.

In Sri Lanka, WP3 worked on improving the efficiency of 26 compost stations on behalf of the Waste Management Authority in the western province in 2023. The results inform capacity development programs and a new digital dashboard for monitoring key performance indicators to be implemented in three municipalities and more than 13 towns in the western province, Sri Lanka’s most populated. We published a range of global reviews, such as an analysis of public-private partnerships working on CBE solutions, covering work by CGIAR and others; a selection of business models for sewage sludge reuse; and food waste minimization strategies through food rescue. Of particular interest was the feasibility analysis of Sri Lanka’s 2021 shift from agro-chemicals to organic fertilizers. We also conducted assessments in Addis Ababa and Dhaka to understand drivers of food safety practices in food markets, with a focus on informal markets. These assessments inform the design of interventions that aim to enhance the capacity of informal food sector businesses to adopt best practices for food safety. Delays occurred with the design and implementation of these interventions, and preliminary results will be available by the end of 2024. Throughout the year, we engaged with relevant stakeholders in food safety in urban food systems, including the launch of the Resilient Cities and One Health Initiative—supported food safety technical working group. The group will be a strategic platform to facilitate the dissemination of research findings and design of scaling activities.

WP4: Improving food environments and consumer behavior for nutrition

● On track



Work Package 4 progress against the theory of change

WP4, implemented with partners in Ghana, the Philippines, and Sri Lanka, progressed on achieving outputs outlined in the Initiative's TOC. The first output is the UFED toolkit, an urban dietary assessment and food environment resource. For this, we first consulted relevant experts, mapped existing tools, and identified gaps. We then created inventories for methods/metrics to assess diets and food environments. Last, we developed the decision tree approach, a prototype recommendation package, and online mockup. UFED will be completed and launched in 2024.

As our second output, WP4 and University of Ghana completed a validation study of an AI phone application to measure nutrient intake among adolescents. Results were presented at a workshop that received national television coverage and in three published briefs.

Third, in Sri Lanka, we conducted fieldwork comparing availability of vendors and food groups to construct a vendor typology and refine food lists for urban food environment assessments. This work will be summarized in a brief. Also in Sri Lanka, we co-developed, with University of California (UC) Davis and Wayamba University, the

protocol and institutional review board for a 2024 study that will assess the validation of a phone-based dietary survey compared to a weighed record.

WP4 conducted nutrition and food environment scoping reviews for our six focal countries (and two secondary countries). All reviews were completed and are being used to develop country profiles to inform future research. The Rwanda profile was published in 2023.

As our final output, we conducted a nutrition-sensitive social protection workshop with government, nonprofit, and UN stakeholders that included discussions on urban programming. Outputs of this workshop will be used in guidance for leveraging SAPs to improve urban diets. An updated literature review of urban SAPs was conducted to supplement the guidance. We also drafted a landscape analysis on urban agriculture and early childhood development in five countries.

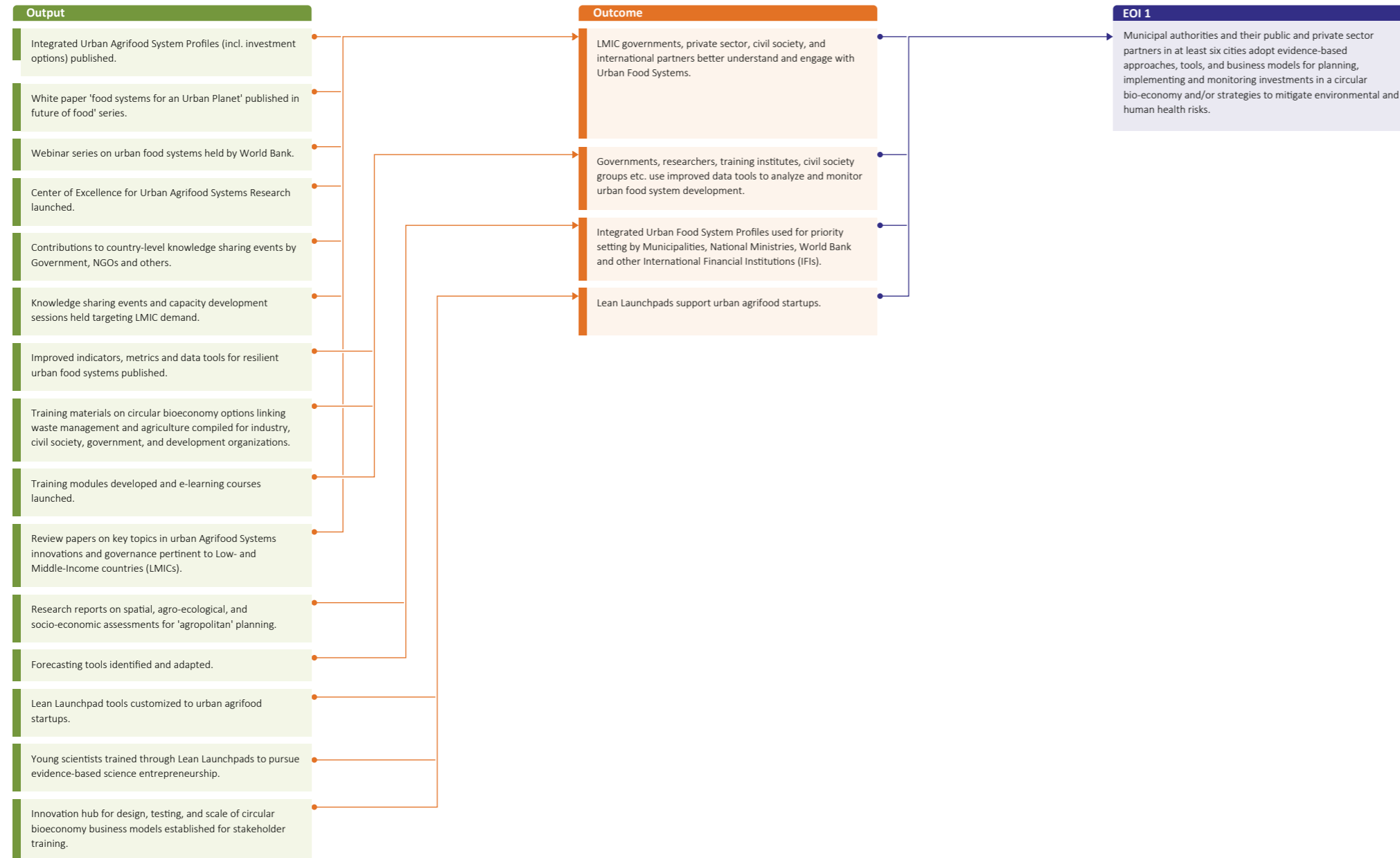
In collaboration with the Sustainable Healthy Diets Initiative, we co-developed outputs related to urban diets, nutrition, and food environments in Ethiopia.



Winnie Cherono decants a supply of fresh milk at her shop near Eldoret, Kenya. Credit: Kabir Dhanji

WP5: Strengthening the evidence base and research and innovation capacities for UPU agrifood system governance and growth

Delayed



Work Package 5 progress against the theory of change

In 2023, WP5 mainly focused on three levels of work: supporting innovation and entrepreneurship, advocating for greater engagement of international partners in the thematic areas of urban food systems, and supporting municipal decision-makers with improved data and decision-making tools. Unfortunately, the scope of work had to be limited due to budget reductions, but progress was still made within these three levels.

In Lima, the partnership between CIP and the National Agrarian University La Molina's (UNALM) Incubagraría trained 237 aspiring scientists and entrepreneurs (115 men and 122 women) in Lean Launchpads to promote evidence-based entrepreneurship in science. In 2023, this collaboration resulted in four initiatives, including an incubation program focused on agrifood and triple-impact business models. The program trained 51 participants (27 men and 24 women) and led to the development of 15 innovation projects.

In Ghana, the CBE Innovation Hub expanded to include more than 12 co-owners and four scaling partners. A dedicated team was established with more than 30 trainers who have expertise in various CBE areas, such as product development, business and financial strategies, partnerships, and gender diversity. These trainers conduct both virtual training and practical sessions in the hub's seven "living labs" across Ghana, focusing on converting organic waste into useful products like compost, dry fuel, and protein from black soldier fly. Additionally, an educational campaign reached more than 5,500 students in Ghana and 900 in Sri Lanka. The campaign aimed to increase awareness of waste management and resource recovery, in collaboration with organizations such as Water & Sanitation for the Urban Poor, Engineers without Borders, and the Soba Kantha Foundation.

In Nairobi, a partnership with RUAF resulted in the publication and distribution of a food systems profile to NCC staff. Additionally, a collaborative effort with NCC led to the creation of a monitoring plan to oversee the advancement of Nairobi's Food System Strategy. This included field pre-testing of two key indicators, conducted with the involvement and guidance of NCC's food and agriculture extension officers.

Another significant achievement was the collaboration between the World Bank and Resilient Cities and agreement to co-author a white paper on resilient urban food systems. Although the white paper is scheduled for publication in 2024, considerable advancements were accomplished in 2023.

Work Package progress rating summary

WORK PACKAGE	PROGRESS RATING & RATIONALE
1	<p>Progress rating</p> <p>Good progress was made on a range of studies that demonstrate challenges to urban food production, highlight clear opportunities for improving urban food production, and show the enthusiasm of stakeholders. However, there have been delays in developing tools that would enable the WP reach its targets.</p>
2	<p>Progress rating</p> <p>Overall, WP2 has continued working toward its stated outcomes. The reduction in budget required us to refocus activities and reduce our overall scope. Considering the activities implemented and the continued engagement with governments, we believe that the Initiative continues to be on track to achieve its outcomes (as currently revisited).</p>
3	<p>Progress rating</p> <p>The new water quality guidelines adopted by FAO for crops, livestock, and fish farming provide access to good agricultural practices for tens of thousands of UPU farmers using unsafe or saline water. This by far exceeds the Initiative's outreach target under EOIO 3. New circular economy tools for M&E are being rolled out in 2024 across 16-plus cities and towns in Sri Lanka, accompanied by related capacity development activities in support of EOIO 1.</p>
4	<p>Progress rating</p> <p>WP4 is progressing on its defined outcomes, with completion of several final knowledge products as well as many intermediary outputs that will feed into briefs, papers, guidelines, and an interactive tool to engage a diverse group of urban stakeholders including policymakers, consumers, and implementers.</p>
5	<p>Progress rating</p> <p>Despite budget constraints in 2023, WP5 achieved considerable advancements across its primary objectives, including innovation and entrepreneurship support, international partnership engagement, and aid to municipal decision-makers with enhanced data and tools. However, the need to narrow the WP's scope and reduce the number of targeted cities for several activities has affected our ability to be on track to achieve our EOIOs.</p>

Section 4: Key results

This section provides an overview of results reported by the CGIAR Research Initiative on Resilient Cities in 2023. These results align with the CGIAR Results Framework and Resilient Cities' theory of change. Source: *Data extracted from the CGIAR Results Dashboard on 29 March 2024.*

All data is sourced from the CGIAR Results Dashboard, accessed on 12/04/2024

OVERVIEW OF REPORTED RESULTS

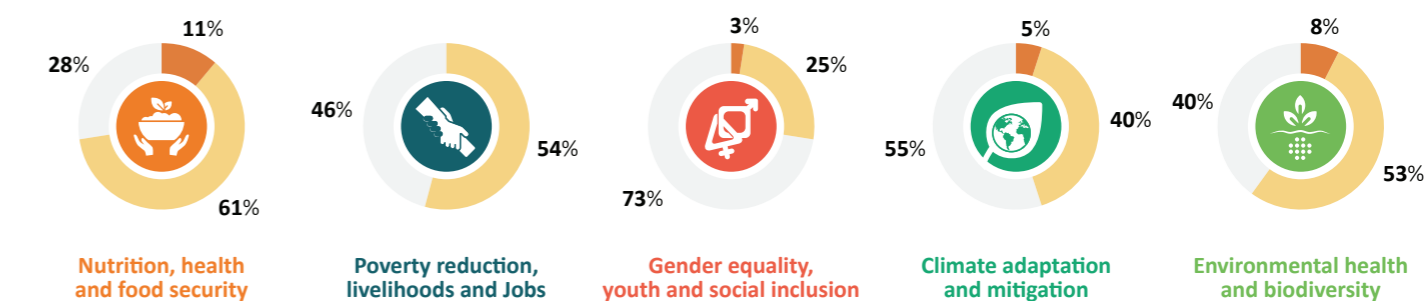
Outputs



Outcomes



PERCENTAGE OF REPORTED RESULTS TAGGED TO CGIAR IMPACT AREAS



● **Principal:** The result is principally about meeting any of the Impact Area objectives, and this is fundamental in its design and expected results. The result would not have been undertaken without this objective.
● **Significant:** The result has made a significant contribution to any of the Impact Area objectives, even though the objective(s) is not the principal focus of the result.
● **Not targeted:** The result did not target any of the Impact Area objectives.

This year, 79 results are reported, up from 28 results reported in 2022. Progress has been made on knowledge products and innovation development. Coming into the final year of the Initiative, more results are expected to be reported at outcome and impact levels.

Definitions

On track

- 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 jeopardize success of Work Package.

Delayed

- Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas.
- Deviations/issues/delays/risks could jeopardize success of Work Package if not managed appropriately.

Off track

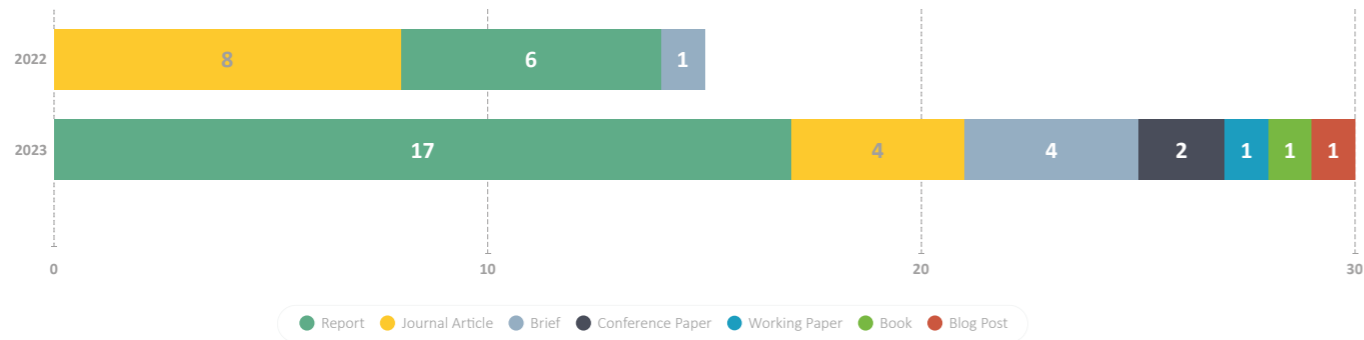
- Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas.
- Deviations/issues/delays/risks do jeopardize success of Work Package.

CONTRIBUTIONS TO THE UN SUSTAINABLE DEVELOPMENT GOALS



The biggest contribution of the Initiative to the SDGs is on Goal 1 (no poverty), Goal 2 (clean water and sanitation), Goal 3 (decent work and economic growth), and Goal 5 (gender equality).

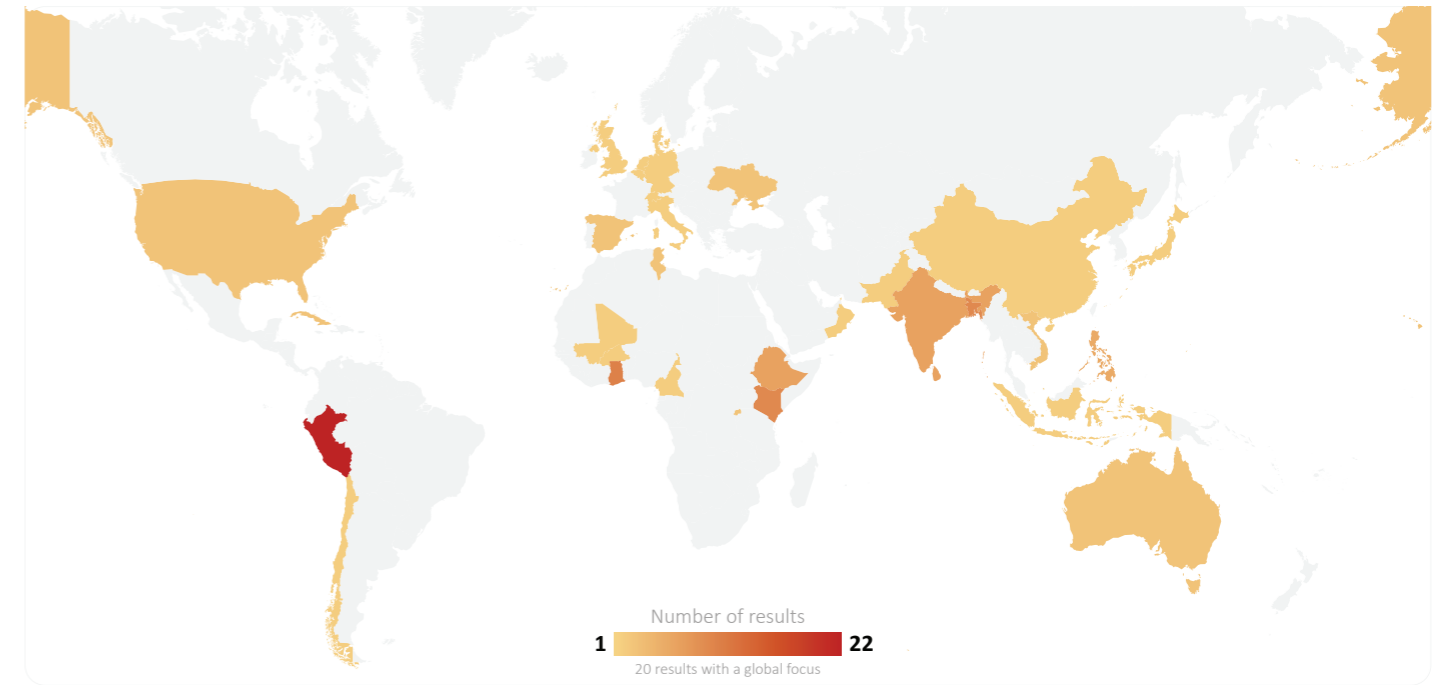
NUMBER OF KNOWLEDGE PRODUCTS BY TYPE (TREND OVERVIEW, 2022-2023)



In 2023, 30 knowledge products were reported. Reports continue to dominate among knowledge products, though it is important to note the increase in journal articles and conference papers.

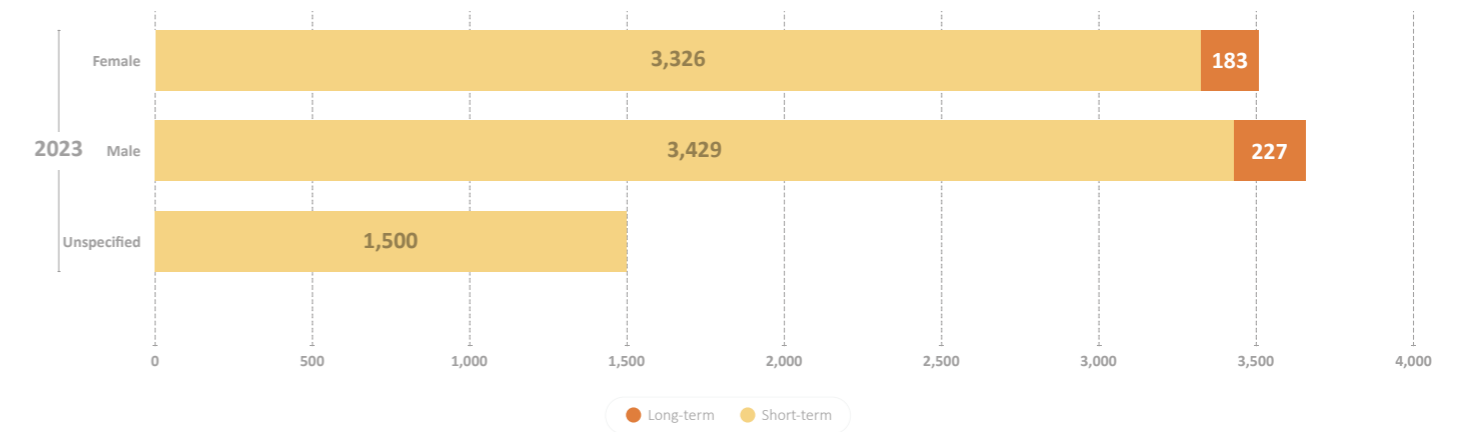
NUMBER OF RESULTS BY COUNTRY

Data here represents an overview of reported results in 2023. One result can impact multiple countries and can therefore be represented multiple times.



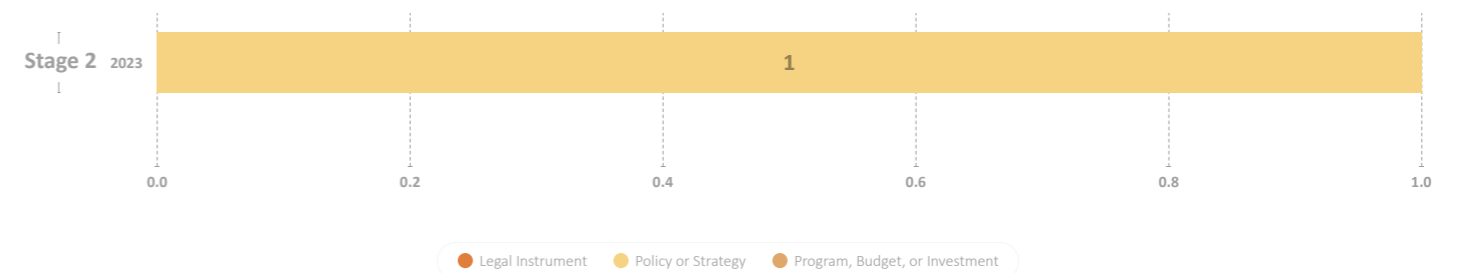
Several outputs have been generated from countries where the Initiative operates, with 21 results having a global focus.

NUMBER OF INDIVIDUALS TRAINED

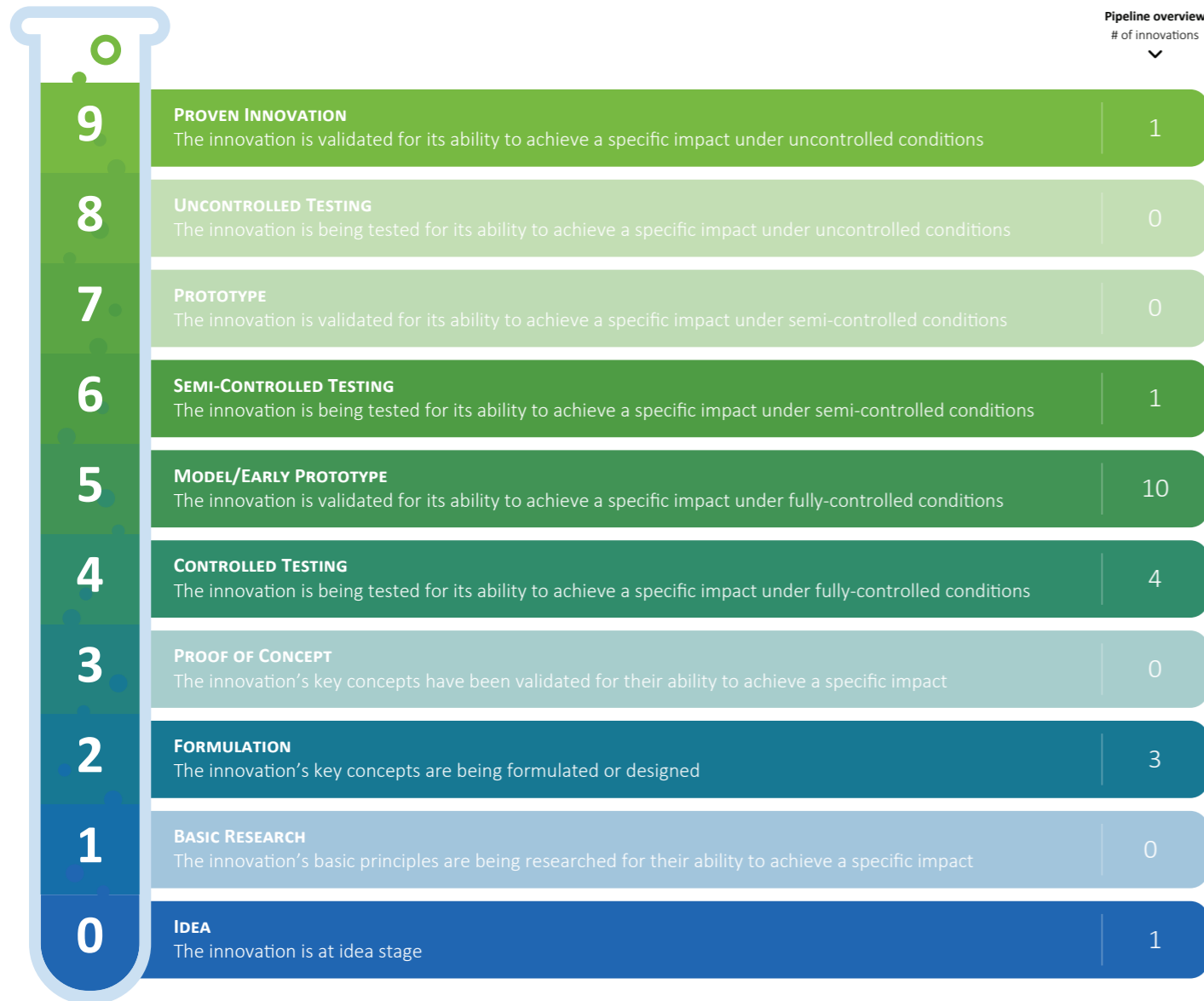


Training has been extended to all genders. An impressive 410 people have undergone long-term trainings, with some trained for master's and PhD levels, which is important for developing sufficient human capital to support urban agrifood systems.

NUMBER OF POLICIES, BY STAGE AND TYPE



NUMBER OF INNOVATIONS REPORTED IN 2023 , BY READINESS LEVEL



Pipeline overview
of innovations

Section 5: Partnerships

Partnerships and Resilient Cities' impact pathways

At the city level, the Initiative has engaged with city governments and private sector entities in the implementation of activities. Examples are the Quezon City Government and the Kenya Dairy Board as part of the vendor business school program; and the Pachacamac district government in Lima through its multistakeholder platform for sustainable food system and the social program called "ollas comunes." Activities are occurring in collaboration with local nongovernmental (NGOs) and civil society organizations, like BCAS in Bangladesh and Ecosad and IDMA in Lima. The Initiative works in alliance with Incubagraría, the Business Incubator of UNALM, with whom it has signed an agreement to partner with the Initiative in Peru. This partner has been strategic in developing activities with young researchers and entrepreneurs, with the aim of boosting their research and innovation capabilities through the development of entrepreneurship and innovation programs designed to promote startups based on science and technology in areas of agriculture, food, and circular economy.

At the national level, Resilient Cities has supported the Ethiopian National One Health Steering Committee in setting up a food safety technical working group to serve as a national forum to strengthen dialogue and capacity sharing among food safety stakeholders in the country. Over time, the group will also provide support and advice

to the Ethiopian government in designing efforts to strengthen food safety in the country. Partnerships remain at the core of the work on scaling CBE innovations. In Sri Lanka, the Initiative works for the national Waste Management Authority and various municipal councils, and in Ghana within the CBE innovation hub (which was invited by Ghana's Ministry of Environment, Science, Technology, and Innovation to join its program on the commercialization of research and innovation) under the Ministry of Sanitation and Water Resources and the Ministry of Food and Agriculture, in collaboration with four private companies, four NGOs, and four other national institutions, including one university.

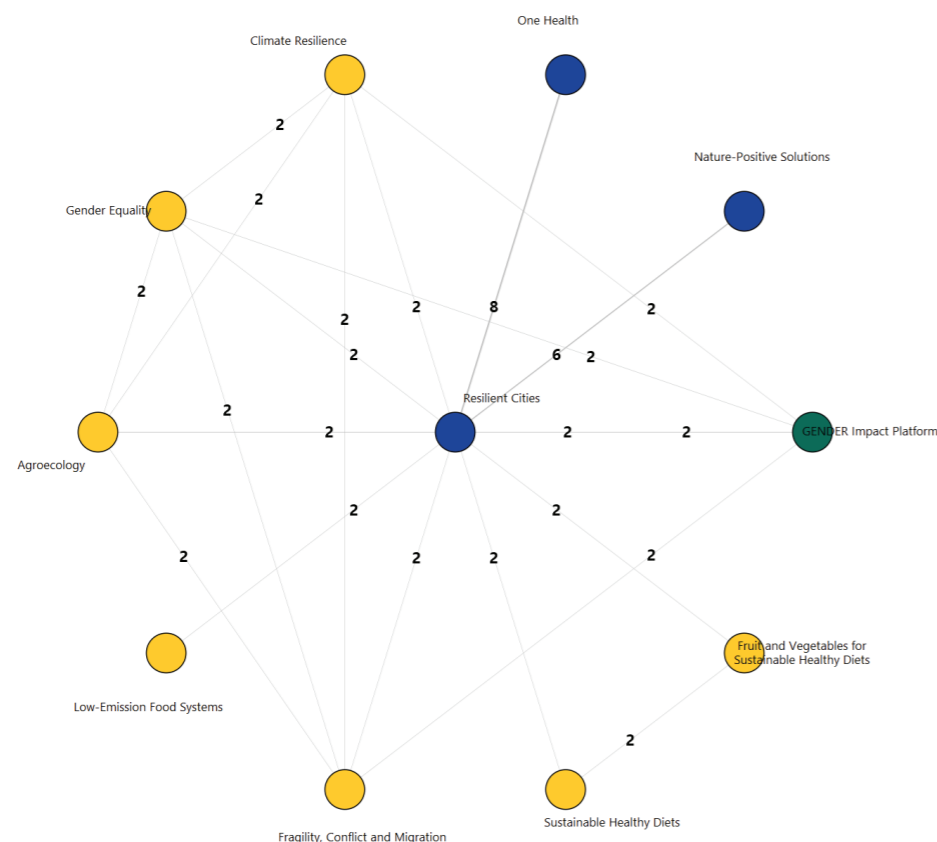
The Initiative also partnered with academic institutions such as the University of Ghana and Penn State University on the Food Recognition Assistance and Nudging Insights (FRANI) AI-assisted phone application to measure nutrient intake in adolescents, and Wayamba University of Sri Lanka and UC Davis to develop a study protocol to assess the validity of using a phone-based 24-hour recall, compared to a weighed record on dietary assessments.

At the multi-country level, the Initiative is working with the [African Union](#) to develop guidelines for African governments to engage with informal markets.



Section 6: CGIAR Portfolio linkages

RESILIENT CITIES' INTERNAL PORTFOLIO NETWORK



Connections are sized by the number of reported results. Collaborations where only one result was reported with a linkage between two Initiatives are excluded.

Portfolio linkages and Resilient Cities' impact pathways

In Bangladesh, Resilient Cities works with the regional Initiative Transforming Agri-Food Systems in South Asia (TAFSSA), which will implement a Photovoice study on consumers' perceptions of food safety among urban poor in Dhaka. In Peru, Resilient Cities and the AgriLAC Resilient Regional Initiative are linked by their examination of both direct and indirect drivers of migration from the Andes to the coast and jungle regions. Understanding the dynamics of migration is crucial, as migration adds pressure to the food system to sustain the increasing population in marginalized areas.

The Initiative's collaboration with the One Health Initiative in Ethiopia is helping strengthen our understanding of the role of food safety in supporting food systems that are resilient and able to offer high-quality, safe food to people. Most of this collaborative work happens in Ethiopia, but could be expanded to other countries in subsequent phases of the Initiatives. Additionally, we are partnering with the Sustainable Healthy Diets Initiative to develop research methodologies that will help understand the linkages between consumers' perceptions of food safety and their food choices. This understanding will direct efforts to influence consumers' food preferences toward safer and more nutritious diets by addressing influences on food choice that stem from perceptions of food safety. These collaborative efforts directly support Resilient Cities' End of Initiative outcomes, particularly those of WP2, WP3, and WP4.

Resilient Cities has linkages with the Nature-Positive Solutions (NPS) Initiative, supporting the establishment of the CBE Innovation Hub in Ghana, and linking key stakeholders from the public and private sectors, research, and education. NPS took over the out-scaling of the hub to other countries such as Colombia, India, and Viet Nam. The innovation hub builds on a decade of CGIAR research on RRR, which evolved from technology development to business modeling, the implementation of public-private partnerships, and commercialization of recovered organic fertilizer and biofuel resources. NPS also supported the CBE investment climate studies across 15 countries.

Further, through linkages with the Fruits and Vegetables for Sustainable Healthy Diets and the Sustainable Healthy Diets Initiatives, Resilient Cities held hybrid seminar series on food environments and dietary assessment research to improve cross-Initiative standardization of tools and methodologies. In Sri Lanka, fieldwork on urban food environments was co-funded by Fruits and Vegetables for Sustainable Healthy Diets, and in the Philippines, a pilot evaluation is being explored with Fruits and Vegetables for Sustainable Healthy Diets/World Food Programme. Also, an AI app is being tested to assess diets and create nudges toward healthier diets. For example, Resilient Cities will apply the Food Systems Accelerator, developed by the Diversification in East and Southern Africa (Ukama Ustawi) Initiative.

Section 7: Adaptive management

RECOMMENDATION

SUPPORTING RATIONALE

Increase visibility of the Initiative's innovations (all WPs) among city governments, NGOs, investors, and other relevant stakeholders.

The Initiative is designing and piloting several promising innovations (such as business models for healthy seedling production and distribution, vendor business school, and food system startups). To proceed in the scaling path, we need to engage more explicitly with investors and stakeholders that may have an interest in taking up innovations. This will increase the potential for uptake by local governments and other actors, as well as increasing awareness of existing innovations and enhancing cross-city learnings and collaboration.

Revise impact targets to reflect lower-than-anticipated budget and uncertainty in the future of the Initiative within the mega programs (MPs).

The annual budget revisions, as well as the uncertainties around the future of the Initiative within the MPs, affect the Initiative's ability to plan and work on pathways toward achieving its outcomes. The lower budget has compromised the implementation of planned activities, and impact targets will need to be revised. The uncertainties around the positioning of the Initiative within the upcoming MPs limit its ability to consider opportunities for expansion, even opportunities for engaging with potential scaling partners.

Improve coordination across WPs and increase communication opportunities to work toward a more integrated research portfolio within the Initiative.

The Initiative's WPs have produced some promising work, but cross-WP collaboration could be strengthened. Budget reductions and uncertainty around the future of the Initiative, as well as the CGIAR portfolio business cycle, have meant that the Initiative has invested less time than anticipated in making arrangements to facilitate cross-WP collaborations. This could be enhanced in 2024 to position the Initiative toward the upcoming MPs.

Section 8: Key result story

Three Power Yogurt: A food innovation to combat childhood anemia in Lima, Peru



Lois Jemutai tests a sample of fresh milk from a farm in her village over a flame in her shop near Eldoret, Kenya. Credit: Kabir Dhanji

In Peru, 42 percent of children were affected by anemia in 2022, according to studies by the country's National Institute of Statistics and Informatics (INEI). In 2021, chronic malnutrition affected 512,000 children in the country. In Lima, the situation is also alarming, with 31 percent of children under five years of age suffering from anemia and 32 percent at risk of malnutrition. Even in Lima Centro, which includes many higher-socioeconomic districts, 31 percent of children are at risk of malnutrition, and 25 percent suffer from anemia, according to data provided by the INEI in 2023.

These numbers show that malnutrition and anemia affect many families in Lima, including those with higher incomes. In a survey conducted by the Three Power team with 60 households in Lima, 45 percent expressed concern about the lack of nutritious and tasty food options on the market for their children. They reported that, on numerous occasions, they had to persuade their children to eat certain foods to achieve the required levels of iron and nutrients.

Access to nutritious food products is crucial for promoting the health and development of children, especially in countries like Peru where anemia and malnutrition remain a significant challenge. It is easy for children and teenagers to find sweets in nearby kiosks, but difficult to find products that are desirable and nutritious. It is increasingly urgent to create nutritious and tasty products that are designed to please the demanding palates of children, while also providing the nutrients necessary for their health and optimal development during this crucial stage.

To address this pressing issue, a group of students and a biotechnology professor from UNALM embarked on an innovative journey. Their solution? Yogurt Three Power—a revolutionary food innovation aimed at combating anemia and malnutrition in children by providing a delicious and highly nutritious food. This innovative idea resulted from innovation and entrepreneurship programs organized and financed by Resilient Cities in association with Incubagraria, the UNALM business incubator.

Three Power Yogurt transforms the Peruvian market by offering a product that boasts three times more protein than any other available yogurt, and is the only yogurt high in iron and vitamin A. Crafted from a unique blend of spirulina, cushuro (Andean seaweed), and bovine blood, and supplemented with vitamin A from sweet potatoes, this yogurt addresses the critical nutritional needs of children suffering from anemia and malnutrition.

Through an innovative process, the yogurt ensures optimal uptake of nutrients and probiotics, promoting energy, vitality, and enhanced learning, while helping to combat anemia and malnutrition among Peru's children and adolescent. The gummy capsules in the yogurt add an element of fun for young consumers, making Three Power Yogurt not only nutritious but also appealing to its target audience.

In June 2023, the Three Power Yogurt team was one of the winning teams in an innovation challenge in Lima. The team received seed capital of US\$600, which they used to develop a product prototype. The prototype has been tested on children and young people, and received widespread acceptance for its innovation and taste.

As the following testimonials demonstrate, the product has been well received by consumers:

”

“A very attractive product for my son, who does not like vegetables or soups, but does like yogurt.”

“Novel and pleasant alternative for my children who are in school.”

“I buy nutritious foods because my daughter suffers from anemia, but normally she doesn't like this kind of food. Having a highly nutritious yogurt would be a good option for her since she likes this drink.”

“An excellent product that many children need.”

Primary Impact Area



Contributing Initiative

Resilient Cities

Contributing Center

CIP

Contributing external partner

La Molina National Agrarian University (UNALM) · Incubagraria · the UNALM Business Incubator

Geographic scope



Country: Peru



Front cover photo

Ghanaian people at the market in Ghana. People of Ghana suffer of poverty due to the unstable economic situation.
Credit: Anton Ivanov

Back cover photo

A crowded market in Dhaka is indicative of a flourishing agricultural economy.
Credit: IFPRI/CGIAR



INITIATIVE ON
Resilient Cities