

UPDATE ON THE CGIAR RESEARCH RESPONSE TO COVID-19

June 2021

The COVID-19 pandemic has caused a global health crisis and massive disruptions to economies and livelihoods. As the global leader in agricultural research, CGIAR immediately took action to analyze and counter the pandemic's potentially devastating impact on food security and nutrition worldwide, particularly in low- and middle-income countries (LMICs), first through the existing research programs, and then with the establishment of a COVID-19 Hub in July 2020 to develop additional research and coordinate system-wide efforts. This report details progress in that research response during the second quarter of 2021.

IMPACTS OF COVID-19 AND RESPONSE MEASURES ON POVERTY, FOOD SYSTEMS AND FOOD SECURITY

In some – predominately high-income – countries, vaccines against COVID-19 are now readily available, new cases are declining, and restrictions are being lifted. This is not the case in many LMICs where CGIAR's work is focused. Recovery from the economic crisis will first require an end to the health crisis. Yet, while public health officials have often noted that “the pandemic is not over anywhere until it is over everywhere,” vaccine access remains deeply unequal. By the end of April 2021, less than 2 percent of Africa's population had been vaccinated, while more than 40 percent of the population in the US and more than 20 percent in Europe had received at least one dose ([Agarwal and Gopinath 2021](#)).

Like the health recovery, the economic recovery is also likely to be very divergent, both across and within countries, fostering the potential for persistent economic damage as a result. The macroeconomic outlook has improved; following an estimated -3.3 percent contraction in 2020, the global economy is projected to grow at 5.6 percent in 2021 (IMF 2021), though markets in LMIC (excluding China) are expected to grow by a more modest 4.4 percent, with 2022

output still expected to be 4.1 percent below pre-pandemic projections ([World Bank 2021](#)). It is worth noting that economic growth projections assume widespread control of the pandemic and so are subject to updating.

The pandemic has also reversed gains in reducing poverty and food insecurity, and deepening inequality remains a significant concern. The World Bank ([2021](#)) estimates that about 90 percent of high-income countries will regain their pre-pandemic levels of per capita GDP by 2022, compared to about one-third of emerging market and developing economies. The number of extreme poor is estimated to have increased by 95–100 million people in 2020, while 80 million more people became undernourished (IMF 2021; [World Bank 2021](#)). Many formerly food-secure farmers, fisherfolk, and livestock owners have been plunged into poverty due to forced asset depletion and an inability to access inputs or sell their produce ([FAO 2021](#)). Women and young, less-skilled workers will continue to be the worst affected, and income inequality is likely to increase significantly as a result ([IMF 2021](#)). While the agri-food system was less impacted than expected overall, its resilience was tested and there were clear winners (such as large supermarket chains and electronic commerce) and losers (such as informal food system actors) ([Béné 2021](#)). The COVID-19 crisis highlighted the importance of the food industry's ability to pivot and adjust to shocks through innovation, both in business processes and technologies.

Swift policy actions implemented in 2020 lessened the economic collapse but left many LMICs with limited policy space and higher debt levels. As we look to “build back better,” we will need to analyze what worked – and what didn't – during the pandemic, recognize the needs of the most vulnerable people, and consider how emergency livelihood support can integrate into longer-term development strategies. For example:

- Social protection programs were widely implemented during the pandemic, mitigating its impacts, but they did not always prevent people from utilising short-term coping strategies such as engaging in distress sales of livestock. These coping mechanisms can have serious longer-term consequences for household members, including jeopardizing future investment opportunities and endangering health and well-being ([Ragasa et al. 2021](#)).
- Food prices have risen over the past year and are predicted to continue to increase further in 2021 ([IMF 2021](#)). In April 2021, the FAO Food Price Index (FFPI) increased for the eleventh consecutive month to its highest level since May 2014, averaging 30.8 percent higher than April 2020 ([FAO 2021](#)). Even modest price increases are compounded by household income losses, particularly in countries dependent on imports ([Schmidt & Dorosh 2021](#)), while disproportionately affecting poor consumers who spend higher shares of their budget on food ([Laborde et al. 2020](#)).

An FAO survey conducted in 11 food-insecure countries from June-November 2020 found that the impacts of the COVID-19 pandemic were comparable to those of major shocks such as conflict or natural disasters, highlighting the importance of viewing the ongoing economic impacts through the same lens that humanitarian actors would view this type of catastrophe ([FAO 2021](#)).

The COVID-19 pandemic and its impacts are likely to be present well into the future, particularly in places where vaccination rates are low, where new variants are emerging and where access to public health services is limited. The large number of people infected worldwide over the past fifteen months has enabled new, more transmissible, variants to emerge, making it harder for countries and individuals to cope. As illustrated above, the inequalities and uncertainties moving forward are enormous. The [IMF \(2021\)](#) argues that forthcoming policies “will need to be carefully tailored to match the stage of the pandemic, the strength of the economic recovery, and economic

circumstances of individual countries.” It will also be important to use dynamic targeting to identify the “new poor,” i.e. those pushed into poverty by the pandemic so that these people can be included in recovery programs ([Chowdhury et al. 2021](#)).

CGIAR COVID-19 HUB PROGRESS OF WORK

The CGIAR COVID-19 Hub provides evidence, innovations and tools to policymakers and food system actors across a wide range of CGIAR expertise for COVID-19 response and recovery. As envisaged from its inception, the CGIAR COVID-19 Hub is complementing, not replacing, the COVID-19 research response undertaken within the existing CGIAR research programs. In 2020, these programs pivoted many ongoing research activities to respond to the pandemic; examples of this are shown in Annex 1.

The Hub activities focus on delivering a set of prioritized research outputs across three thematic work areas – Value Chain Fractures; One Health; and Food System Resilience – and five countries. The objectives and planned outputs under each area are listed in Annex 2. Two cross-CGIAR functions of the Hub can be highlighted. The first is synthesizing findings and distilling lessons from multiple CGIAR studies on value chain fractures and food system resilience. The second is coordinating prioritized cross-CGIAR support to COVID-19 response and recovery through five country teams.

Work Area 1: Value Chain Fractures

The [Analytical Framework for Addressing Value Chain Fractures](#) identified two types of policies affecting agri-food value chains: movement and market restrictions, and using this framework, defined research questions to use moving forward. The Working Group also developed an outline of the synthesis “Effects of the COVID-19 pandemic on agri-food value chains: Fractures, responses and opportunities for building back better.” A review of the first set of studies found that very few addressed impacts of COVID-19 on the middle of the value chain (e.g. traders, wholesalers, processors, retailers) and the corresponding responses. Evidence from studies on producers pointed to many

constraints, including labor, input supplies, credit and market outlets for outputs. Perishable foods appeared to be more affected than non-perishable foods.

To fill this gap in middle-market research, four new studies were launched, focusing on mitigative measures used by midstream value chain actors during the pandemic. These include fish, potato, rice and vegetable value chains, and analyze digital innovations, a procurement program, and a mechanization program. These studies are being prepared in Bangladesh, India, and Kenya.

Planned work for the second half of 2021:

Update of the inventory of CGIAR (and external) value chain studies on COVID-19 with studies carried out between February and May 2021 on the effectiveness of mitigative measures on food supply chains.

Synthesis of lessons learned from existing studies of value chains during COVID-19. This will analyze how effects of COVID-19 restrictions affected different types of food supply chains (e.g. domestic vs international) and how well mitigative measures performed under different conditions. This involves four case studies on of how well innovations in value chains mitigated impacts of COVID-19 including digital innovations and government programs, and will include several different food value chains in Bangladesh, India and Kenya.

Work Area 2: One Health

A CGIAR scientist was one of the ten international scientists who took part in the 28-day [WHO mission to Wuhan](#) to understand how the virus began spreading in humans. He contributed to the discussion on livestock, wildlife and food system implications and the importance of taking a [One Health approach](#) to ensure a that the world is better prepared for future health emergencies.

A policy seminar on [COVID-19 and implications for One Health research](#) was held on 4 May, during which participants discussed the relevant use of the One Health approach to address the current COVID-19 pandemic and health issues at the interface of animal-

human-environment, in particular issues linked to agriculture and livestock such as zoonotic diseases and food safety. Experiences and practical advice on connecting sectoral work – most notably on human health and animal health – were shared from research, country and donor perspectives.

A crossover review and case study on wildlife trade in Vietnam is in progress. The team has visited a site in the Mekong Delta, and in North Vietnam near the border with China, as part of a virus transmission study. They met with partners in both animal and human health, including authorities and academia, and visited live animal markets and livestock and wildlife farms, and plan sampling from pigs, rats, bats and minks to analyse the coronavirus.

A study in Kenya on slaughterhouses as hotspots for COVID-19 includes ongoing data collection among workers and community members. Other work on epidemiology includes a global disease mapping framework and a serological study in Guinea where there was recently a new Ebola outbreak. The research in Guinea includes a meta-analysis of human GPS tracking data to evaluate the impacts of human mobility on spillover risks.

Planned work for the second half of 2021:

Pathogen crossovers

- Review of key drivers associated with crossover of pandemic-potential pathogens from animals to humans, and policy approaches to addressing these risks.
- A study on wildlife trade and wildlife farming in Vietnam.

Epidemiology

- Framework for mapping COVID-19 and other zoonotic disease risks in different agricultural production systems.
- A case study in Vietnam on transmission at the interface of humans, domestic animals, and wildlife in different host ecosystems.
- A study on slaughterhouses as hotspots for COVID-19 transmission in Kenya.

- Framework for One Health assessment of aquatic food systems in Bangladesh.

Modelling health and economic impacts of COVID-19 and associated interventions, at country level

- Integrating economic and epidemiological models to assess health impacts of lockdowns and economic impacts of the disease.

Work Area 3: Support Country COVID-19 Responses

The CGIAR COVID-19 Hub is providing country-specific support to pandemic response and recovery in Bangladesh, Ethiopia, Malawi, Myanmar and Nigeria. Research action plans were co-designed and are now co-implemented with national partners, with two to three priority areas focused on strengthening food systems' performance during the pandemic and building long-term resilience. This work builds upon existing relations and collaboration, both within CGIAR and with country partners.

Under this work area, the Hub also facilitates cross-country knowledge sharing on COVID-19 responses and will provide a synthesis of lessons for One CGIAR country engagement.

Research carried out to date includes:

Bangladesh: The research priorities of the Hub in Bangladesh include developing a food system monitoring dashboard, developing a nutrient-secure homestead app, and conducting a feasibility study for digital markets for women. Components of the food system monitoring dashboard are under development, including a digital disease monitor and hotspot locator, with modules on crop, fish and livestock disease. It also includes monitors on weather for crop and fish production, farm stress, satellite-data based planting/harvesting, and floods. The prototype for the nutrient-secure homestead app is completed and will be tested by the Department of Agricultural Extension.

Ethiopia: The country team consulted with partners to finalize decisions on workstreams, geographies, roles, responsibilities and budget allocations. The team presented the final action plan to the Agricultural Research & Technology Task Force of the Rural

Economy Development & Food Security, a donor-government sector working group. The workstreams are: Coordination; Assessment and mapping of seed supply; Consumption, food safety, nutrition, and health messaging; and Digitalization. Field data were collected to assess and map seed supply. A literature review is underway for consumption, food safety, nutrition, and health messaging. As part of the digitalization workstream, researchers reviewed apps and dashboards to customize for the Ethiopian situation.

Malawi: This action plan includes updating economic modelling of COVID-19 impacts as well as seed system improvement, building on and expanding ongoing work in these areas. An [update on the short-term impacts of COVID-19 on the Malawian economy](#) was published in April, on how the impacts of control measures are influencing recovery paths of the Malawian economy in 2021. The findings will feed into government policymaking decisions. A study on seed system improvements is also underway, while a demonstration of climate-smart technologies is being planned.

Myanmar: Two research priorities were established as a result of country stakeholder engagement: Assessing impacts of COVID-19 on agri-food and fish supply chains; and Assessing impacts of COVID-19 on women's agribusinesses and value chains in the Gulf of Mottama. Research teams are set up and research protocols have been developed for both studies.

Nigeria: The Hub's work in Nigeria is divided into three work packages, closely aligned with the government's priorities in agriculture: 1) expanding access to improved chicken breeds and quality seeds of improved varieties (rice, sorghum/millet and orange-fleshed sweet potato); 2) strengthening capacity of women and youth; and 3) generating and providing policy evidence. Seed companies and female and youth beneficiaries have been selected for participation under (1), while field officers have been recruited and trained to distribute farmer-preferred chicken breeds. Under (2), training focusing on enterprise development, value addition, business management and marketing was completed in Kano, Kaduna and Lagos, and data collection is ongoing. A questionnaire

for the second round of a phone survey to analyze COVID-19 impacts on livelihoods and food security was completed.

Planned work for the second half of 2021:

The research outputs outlined above will be completed by the end of 2021, generating the following expected outcomes:

Bangladesh: The various monitoring systems (e.g. the weather system and the digital system of crop, livestock and fish health intelligence), once completed, will enable faster decision-making for and intervention by government agencies in response to COVID-19 and other shocks. The nutrient-secure homestead app will be finalized and will help the beneficiaries to close the household-level nutritional deficit, with an expected scaling up path through a larger project funded by the Government of Bangladesh in this area. Finally, a feasibility study for digital markets for women will be completed, providing insights on how this type of market can benefit female producers, consumers, and entrepreneurs as an input to government programs and investment projects to establish digital markets.

Ethiopia: When finalized later this year, mapping of seed supply chains will enable stakeholders to access evidence on seed production, stocks, and demand by geographic location. Messages on consumption, food safety, and Water, Sanitation and Hygiene (WASH) will be disseminated through different outlets to provide scientific evidence on these topics to the public and deter misinformation. Apps and digital platforms developed as part of the Hub will be linked to different outlets, including SMS, FM radio/TV programs, and print media, establishing an important source of information for various food systems stakeholders (e.g. in the seed value chain).

Malawi: Demonstration of climate-smart technologies will take place starting in August. Dissemination and scaling up of improved seed of high yielding and nutritious crop varieties will happen through public-private partnerships, while working through farmer field schools, lead farmers, and digital extension approaches will lead to adoption of climate-smart

agricultural practices by farmers, focusing on those most affected by COVID-19.

Myanmar: Assessments of impacts of COVID-19 on agri-food and fish supply chains and on women's agribusinesses and value chains in the Gulf of Mottama will be carried out. The country team will also prepare a short synthesis report on the Hub activities in Myanmar, including policy options to build recovery and resilience for food, land, and water value chains and systems. Research outputs will be disseminated through the Myanmar Fisheries Federation, Technical Departments of Ministry of Agriculture, Livestock, and Irrigation (MOALI), local community-based management networks, and international development projects, to inform the country's COVID-19 response and recovery.

Nigeria: The Hub will train 500 youth and women in sorghum, millet, and groundnut processing. Six hundred women will be trained in value addition for orange-fleshed sweet potato agribusiness. Of the 600 trainees, 60 (10 percent) will be given starter packs. The team will also complete dissemination of breeder seeds and farmer-preferred chicken breeds.

To provide policy evidence on COVID-19 impacts on livelihoods and food security, econometric analysis of the panel data collected from two survey rounds will be finalized. Complementing this work, a phone survey with fish supply chain actors will be carried out to assess impacts of COVID-19 on the availability and price of aquatic foods and production inputs, contributing evidence to support effective policy interventions to mitigate household-level impacts of COVID-19.

Work Area 4: Food System Resilience

The [first global assessment \(62 countries\) of COVID-19's impacts on food security](#) was published in February 2021. It focuses on food security and nutrition impacts and outlines preliminary elements of a food system resilience research agenda to build back better. It also highlights the importance of applying resilience analysis principles in future work and analyzing what worked and did not, in both short-term (reactive) responses and longer-term recovery strategies.

Planned work for the second half of 2021:

Five studies with analysis and recommendations on how to address vulnerabilities and provide solutions to build resilience will be conducted and will link, as appropriate, with the other three work areas. These studies will focus on:

- Food environments: Analysis of the ways actors and processes that characterise the food environment (proximity, convenience, affordability, etc.) have been affected by the COVID-19 pandemic and the interventions, changes in behavior or strategies adopted in response.
- Diversification: An examination of how diversification (e.g. production and midstream operations) can improve resilience to shocks of farmers and other food system actors.
- Urban-rural relations (*linking with Work Area 1*): Analysis of urban-rural linkages and their role in increasing food system resilience, with focus on interconnectivity and labor mobility of and their role in securing livelihoods in times of crises.
- Integrated surveillance of food/health/land (*linking with Work Area 2*): Research on how the existing disease surveillance systems (human, domestic animals, wild animals, environment) can be improved.
- Foresight analysis: Establish which new trends, drivers, levers to build resilience will influence food systems and their ability to withstand shocks.

Emerging lessons for future CGIAR crisis response

COVID-19 is a global health, food, social and economic crisis that required [a collective CGIAR research response](#). The Hub adapted the existing CGIAR structures and networks to launch some joint research actions through thematic working groups and country teams and implement them quickly with partners.

Resilience building has become one of the key features of the emerging CGIAR research portfolio, along with others, such as sustainability, inclusion, and efficiency. To mitigate the risks to food systems (climate, natural disasters, health, conflict) and reduce the negative effects of shocks on vulnerable groups, future CGIAR research can include:

- Better understanding of food system actor vulnerabilities and resilience capacity.
- Stronger risk mapping, monitoring systems, and integrated responses at the interface of health, food, veterinary, and environment.
- Better understanding of the 'hidden middle' of the value chain and the interactions across value chains.
- Increased testing of innovations that are hypothesized to strengthen resilience in agri-food systems.

One emerging lesson is that an agile and coordinated response to emergencies requires an effective country engagement process. The Hub is testing the approaches and processes developed as part of transition to One CGIAR. Future emergency response by CGIAR will need to be supported by appropriate institutional structures, lead by Regional and Country offices.

To learn more about the CGIAR COVID-19 Hub, visit www.a4nh.cgiar.org/covidhub/ or email COVID-19-Hub@cgiar.org

ANNEX 1: Examples of CGIAR Research Program and Platform research in support of COVID-19 response and recovery

As the examples below illustrate, CGIAR Research Programs and Platforms carried out a wide range of COVID-19-relevant research by pivoting their 2020 research plans. Outputs range from assessments of the effects of the pandemic on households, value chain, economies and landscapes to analysis of options for addressing the challenges arising from COVID-19. Research also included evidence and tools for building resilience.

CRPs	
A4NH	Researchers examined the impact of the COVID-19 outbreak on nutrition, highlighting the expected increase in child malnutrition , and made recommendations on how to protect vulnerable groups . HarvestPlus continued to deliver biofortified planting material to farmers through various partner-based approaches, consistently innovating to minimize risks of disruptions to food supply chains.
CCAFS	CCAFS launched a project to harness data and evidence to better understand COVID-19 impacts on agricultural production systems, local economies, and natural resources in Southern Africa; inform policies and action in the Southern African Development Community; and develop a monitoring framework to evaluate changes beyond the pandemic.
FISH	To track and better understand COVID-19 impacts and formulate appropriate responses, FISH carried out a monthly survey with a panel of 768 respondents from aquaculture and fisheries value chains in five countries : Bangladesh, Egypt, India, Myanmar and Nigeria. It also established a dedicated COVID-19 portal to rapidly share content and disseminate relevant documents and material related to COVID-19.
FTA	Studies assessed impacts of the crisis on selected value chains, including wood fuel in the Democratic Republic of Congo, shea in Burkina Faso, forestry enterprises in Cameroon and natural rubber in Indonesia. FTA also published an innovative and comprehensive framework for analyzing the pathways and impacts of COVID-19 on agroecosystem resilience and related livelihoods and landscapes.
GLDC	Studies examined the type of disruptions and coping mechanisms in the production systems of groundnut value actors in Ghana, and to assess the effects of lockdowns on agricultural systems in South Asia. Researchers also gathered lessons on how the deployment of digital tools across bean growing countries can help with sustaining production and trade.
LIVESTOCK	Researchers supported the Ethiopian government in its effort to contain the spread of COVID-19 through optimizing and validating pooled testing to increase efficiency. They also explored options to predict the spread of the disease ; mapping the distribution of health facilities, stores, marketing centers and transport lines to define the optimal route of communication for emergency management ; and developed a digital platform to store, update and share information related to COVID-19 in the country.
MAIZE and WHEAT	Scientists provided <i>ex-ante</i> , foresight, and prioritization advice to decision makers as part of a CGIAR-wide initiative in Bangladesh that provided policy advice on coping with the pandemic to the Secretary of Agriculture and Ministry line agencies. To prevent future health shocks, scientists identified biodiversity stress/loss as a critical factor in the emergence of infectious diseases.
PIM	Scientists built on past investments in modeling tools to assess the short-term impacts of COVID-19 and policy responses at country level for more than 20 countries and engaged closely with the governments of Egypt , Myanmar , Nigeria , Rwanda and South Africa to identify policy priorities to support recovery. These studies were complemented by assessments of the effects of COVID-19 restrictions on rural households and the delivery of health services in Ethiopia, while ongoing work in Mozambique on school

	meals and literacy programs was augmented by an evaluation of the impacts of COVID-19-related school closures on adolescent human capital and mental health.
RICE	Reserachers drew on an analysis of the domestic rice value chain in West Africa to anticipate the impacts of the COVID-19 pandemic on the resilience of the value chain and its capacity to sustain food security in the region.
RTB	RTB research revealed that strong local market chains, robust smallholder production systems, and increasing commercial utilization make RTB crops powerful vehicles for securing nutrition when markets and mobility are uncertain.
WLE	WLE worked with the Government of India on a drought monitoring system to show the state of maturity of crops and thereby identify places that needed to be harvested but were potentially at risk due to COVID-19 lockdowns. Scientist also worked with partners to couple extreme weather forecasts with crop information to highlight where crops might be at risk of extreme weather events , combining it with information on the number of COVID-19 cases in affected regions to help governments coordinate and plan harvests and disaster preparedness measures during the pandemic.
Platforms	
Big Data	COVID-19 accelerated digital transformation in agricultural research for development. A mobile phone-based panel survey to assess COVID-19 impacts on farming was tested in Kenya, through the “Let it Rain” campaign and as part of the project on rapid diagnostics of COVID-19 farming impacts . A digital course titled Herd opportunity is providing training to livestock farmers. Eyes on the ground for agricultural microcredit aims to unlock agricultural microcredit to farmers in Odisha, India.
Excellence in Breeding	COVID-19 provided operational lessons. As workshops and trainings shifted online, new formats for interaction were tested, proving to be more than adaptations and offering new tools and resources to deliver on EiB’s mission in the future. Moreover, EiB Toolbox and Learning Management System (LMS) was further developed in 2020.
Genebanks	Efforts focused on sustaining sufficient staff in the laboratories, screenhouses and fields to carry out critical operations to avoid the loss of accessions.
GENDER	A review of emerging evidence on COVID-19 and gender in the context of agriculture and food systems has been completed. This review identified evidence gaps across thematic areas and geographies, and allowed the launch of four new projects to address these gaps.

ANNEX 2: CGIAR COVID-19 Hub objectives and planned outputs

Work Area	Objectives	Planned Outputs in 2021
1. Address value chain fractures	Develop syntheses of country-, value chain-, and commodity-specific case studies and new collaborative research to inform policy and investment decisions and actions to restore food/agriculture value chains.	<ol style="list-style-type: none"> 1. Framework for assessing value chain fractures 2. Inventory of CGIAR value chain studies on COVID-19 to date 3. Synthesis of lessons learned from existing studies of value chains during COVID-19 4. Collaborative study of how well innovations in value chains mitigated impacts of COVID-19
2. Integrate a One Health approach to COVID-19 responses	Link health, economic, and environment models and provide targeted reports and joint modelling for three to four priority countries, plus a series of high-profile evidence papers. This will build understanding of human, animal, and environmental health, de-risk agricultural hotspots, and avoid future zoonosis cross-over events.	<p><i>Pathogen crossovers</i></p> <ol style="list-style-type: none"> 1. Review of key risk factors associated with cross-over of pandemic-potential pathogens from animals to humans 2. Vietnam case study with analysis of risks from wild bushmeat, wildlife farming and livestock. <p><i>Epidemiology</i></p> <ol style="list-style-type: none"> 3. Framework to map COVID-19 and other zoonotic diseases on agricultural productivity. 4. Transmission at the interface of humans, domestic animals, and wildlife in different host ecosystems in Vietnam. 5. Slaughterhouses as “hot-spots” for SARS-CoV-2 transmission in Kenya 6. Framework for One Health assessment of aquatic food systems in Bangladesh <p><i>Epidemiological and economic modeling</i></p> <ol style="list-style-type: none"> 7. Framework and analysis of joint models in two to three countries
3. Support country COVID-19 responses	Establish a response network across CGIAR partner countries and provide national partners with analyses, evidence-based recommendations, and scalable solutions on policies, strategies, and investment options for integrated COVID-19 crisis and recovery responses.	<ol style="list-style-type: none"> 1. Implementation of co-designed action plans with partners in Bangladesh, Ethiopia, Malawi, Myanmar and Nigeria 2. Synthesis of lessons learned from country engagement and providing agile cross-CGIAR COVID-19 research response
4. Address food systems’ fragilities and build back better	Identify the impacts of COVID-19 on food systems’ fragilities and integrate foresight modelling results and prioritized solutions to improve resilience and build back better, with particular emphasis on vulnerable groups and country priorities.	<ol style="list-style-type: none"> 1. Literature review of relevant studies on food system fragilities and how to address vulnerabilities. 2. Working paper and policy brief on mitigating vulnerabilities and reinforcing resilience with particular emphasis on vulnerable groups, country and regional priorities, through integration of sustainable production, trade and consumption strategies and governance for risk prevention to improve food system adaptation processes. 3. Foresight analysis incorporating this new knowledge to assist the re-design and scaling of improved food systems in building back better.