



Sustainable crop production and COVID-19

INTRODUCTION

The COVID-19 pandemic comes at a time when around 820 million people in the world suffer from chronic hunger and more than 2 billion are malnourished. Even before the pandemic struck, the ambitious path that was laid out by the Sustainable Development Goals (SDGs) was going to require a concerted effort to stay on track; COVID-19 has fundamentally changed the context in which Agenda 2030 was being pursued and we now risk a reversal of gains made in the last few years.

According to projections, world food production will have to increase by 50 percent (over 2012 levels) by 2050. This increase will need to be achieved with the same or fewer inputs under conditions of widespread land degradation, increasing competition for both land and water and the uncertainties of climate change. This is the premise for FAO's work aimed at enabling farmers' transition to sustainable crop production intensification and diversification. FAO strengthens the institutional and human capacities of Member Countries – through a combination of standard setting, policies and regulations on the one hand and field level operational activities on the other. It does so using the following pillars of sustainable crop production intensification: farming systems; soil health; crops and varieties; water management; plant protection and the enabling policies and institutions.

The disruptions to these activities caused by the COVID-19 pandemic, coupled with the ongoing stresses from transboundary pests and diseases (in particular the current desert locust upsurge) and the increasing frequency and intensification of erratic weather events due to climate change, have considerable short-, medium- and long-term consequences. The prevalence of resource-poor smallholder farmers, significant yield gaps, and suboptimal institutions and enabling policy regimes characterize the crop production systems of developing Member Countries. These are the very systems that are the most vulnerable to the effects of this pandemic.

This policy brief is intended for decision-makers in developing Member Countries where food security and nutrition are underpinned by the outputs of hundreds of millions of smallholder farmers. It provides guidance on actionable measures for mitigating the effects of the COVID-19 pandemic on crop production to support sustainable food systems, and ultimately enhancing the resilience of institutions and infrastructure to ensure delivery of safe and nutritious food.

SHORT-TERM IMPACT ON SUSTAINABLE CROP PRODUCTION

The poorest and most vulnerable groups will experience the most negative effects of the current pandemic. This demographic includes subsistence farmers as well as smallholder farmers' enterprises.

The immediate, or **short-term**, impacts of the COVID-19 pandemic on sustainable crop production systems derive from the near universal response of governments to impose lockdowns in countries. This has resulted in the inability of farmers, farm labourers, farm service providers, extension officers, input suppliers, processors and other various actors in the food system to perform their tasks. These constraints may manifest themselves in the failure to plant crops in a timely manner, or to use the optimal quality and quantities of inputs needed (such as seeds, fertilizers, pesticides), to carry out varied cultural practices, and harvest and post-harvest activities. The effect of this is that the expected crop produce is not readily available to those who need it where and when it is needed. While some may experience temporary setbacks from which production systems may recover relatively easily, the effects on more vulnerable smallholder farmers will be long-lasting.

Markets and related services, such as transport, are being disrupted or shut down. Farmers producing perishable products with labour-intense value chains, such as fruits and vegetables, are in an especially vulnerable position. Reduced labour mobility threatens to leave some high value crops rotting in the fields and without adequate storage, the window of time to sell these products before they become unmarketable is short. Changes in market demand and consumer behaviour have been observed in some countries (for example, increased demand for staples and canned food with longer shelf lives). As a consequence, there is a higher risk of food loss of fruits and vegetables brought about by COVID-19. This translates into lower incomes and money for smallholder farmers, which then negatively affects their household food security.

In countries where farming and food production are designated as essential services, farmers have managed to maintain their access to markets, and nutritious food continues to be in high demand. Markets for exported fruits and staple crops for the time being have remained open, but the performance of global trade of other agriculture commodities like cotton, cocoa, coffee and sugar has been variable. The closure of factories has resulted in reduced demand for some commodities such as coffee and cotton.

Public services supporting crop production, such as extension diagnostics, and official support services including training, coordination meetings, field visits, and pest monitoring and surveillance have also been disrupted during the pandemic. The support received through these services is crucial for farmers to continue their farming activities in a sustainable manner. Agriculture may be among the sectors considered as essential in some instances, and thus concessions may be granted. However, reduced human mobility is still likely to affect support services in most countries. For instance, due to lower workforce numbers in public institutions, reduction of allocated state budget and travel limitations, monitoring of crop fields and of plant pests and diseases, which is already weak in many developing countries, will be negatively affected.

Regional cooperation and cross-border pest and disease monitoring and control activities have been impacted too. This is extremely worrying, especially with regard to pests and diseases that can spread fast over borders, such as locusts, fall armyworm and rust diseases of wheat. Severe difficulties in implementing pest and disease control measures will result in substantial losses in crop production. This poses an additional threat to food security.

MEDIUM- AND LONG-TERM IMPACTS ON SUSTAINABLE CROP PRODUCTION

In the **medium term**, the impacts of the disruptions will be felt in the scarcity of inputs. For instance, the failure to plant or harvest at the right times or to conduct necessary field inspections may result in a lack of quality assured seeds. This scarcity may also be replicated with other inputs if their production has been disrupted or input-related businesses have gone under. In addition,

critical research and development (R&D) activities may have been disrupted with significant consequences. For instance, trials may not have been set up, and data may not have been collected and/or harvested when it should have been, impacting institutions' abilities to release new crop varieties or provide evidence-based extension guidelines. Additionally, genebanks (seed, *in vitro* and field) may not have been managed optimally, leading to the loss of critically important sources of traits for improving our crops.

Some of the medium-term impacts may persist into **long-term** constraints. A prolonged economic shock will affect the purchasing capacity of farmers for inputs and other foods that they do not produce. Likewise, the effective demands by consumers, which spur production, may also be lost thereby removing a critical incentive for farming. The domino effect may lead to the failure of many businesses, especially small- and medium-scale enterprises that either service crop production or are dependent on the produce.

WHAT CAN BE DONE TO SUPPORT SMALLHOLDER FARMERS?

In the **short term**, efforts must be invested in preventing deepening disruptions to crop production and protection systems – much in the same way as the food supply chains of many countries were exempted from the restrictions to the movements of persons, goods and services. For these life-saving food supply chains to remain available in the future, no crop production season should be lost. Government policies and incentives will be key in ensuring that disruptions are reduced to the minimum. Mitigation measures that countries may consider include:

- **Adopting** financial support measures for smallholder farmers, for example deferring agriculture credit payments, reducing and/or waiving interest rates on loans and price control of essential inputs.
- **Ensuring** agricultural tasks in the cropping cycle are performed on time, so that crops ready for harvest are not lost and planting is not disrupted. The Crop Calendar¹ is a tool that provides timely information on planting, sowing and harvesting periods of key food and agricultural commodities. This tool supports farmers and agriculture extensionists across the world in taking appropriate decisions on crops and their sowing period, respecting the agroecological dimension. The traffic lights in the mapping tool² present FAO recommendations on planting and harvesting for each commodity and country. A green light advises to proceed with the task while speeding up the pace. A yellow light advises to monitor and assess the situation, as the crisis unfolds. The yellow light also suggests speeding up the task if it is deemed necessary and feasible.
- **Managing** human mobility safely, as urban labour returns to rural hinterlands, to ensure a labour force; and **considering** possible ways to replace labour with targeted and appropriate mechanization services and technology in production, processing and for transportation of inputs and goods. For example, provision of mechanization services to improve the efficiency of operations along the agri-food chains adds value to products, increases the shelf life (thereby reducing the risk of food loss) and boosts incomes.
- **Creating** mechanisms to make food supply chains more inclusive for smallholder farmers (for example, ad hoc distribution centres, selling points, market hubs, etc. that are compatible with restrictions such as physical distancing).
- **Utilizing** digital technology to provide real-time reliable information to farmers and traders on prices and market demands, and supporting farmers for matching supply with demand to boost smallholders' connection to urban and local markets and processors.

¹ <http://www.fao.org/agriculture/seed/cropcalendar/welcome.do>

² <http://www.fao.org/2019-ncov/covid-19-crop-calendars/en/>

- **Advocating for and encouraging** local food production and simplified food supply chains; the term “think global, act local” seems to be more appropriate than ever. This includes urban and peri-urban horticulture (including through protected cultivation) and more local distribution within a shorter supply chain to increase availability in urban markets and consumers’ access to nutritious fruits and vegetables.
- **Enhancing**, where possible, testing and implementation of automated systems for pest and crop health surveillance (for example, remote sensing systems for crop health and soil moisture monitoring, as well as radars to monitor movements of migratory pests).
- **Strengthening** capacity to respond quickly and efficiently to crises by capitalizing on monitoring and early intervention through innovation, improved data management, analysis and forecasting, efficient information and knowledge exchange and effective contingency planning.
- **Facilitating** the Rotterdam Convention’s network of Designated National Authorities (DNAs) to advise farmers (using cell phone SMS at no costs) about the risks of using hazardous pesticides and the alternative option of using biopesticides and/or other alternative methods in order to protect human and environmental health.

In the **medium term**, once it is safe, all elements of crop production and protection systems should be assessed for their continuing efficient provision of nutritious food. Areas of local food systems that need enhanced resilience to withstand and/or recover from similar shocks in the future should also be identified.

Efforts should be invested in paving the way for transitioning emergency support interventions into development-oriented support. In the **long term**, the ongoing development-mode work of governments, FAO and development partners must continue and target institutional and human capacities, as well as the enabling environments for the entire crop production and protection value chain. Interventions must start from R&D endeavours that aim to produce well-adapted, nutritious, input use-efficient and resilient crop varieties suited to prevailing production systems, agroecological contexts and end-user preferences. The focus on R&D must also include agronomics, i.e. the production packages and the complementary integrated disease and pest management packages.

Based on the outcomes of the needs assessment, countries should provide sustained investment, engender public-private partnerships, and enact laws and relevant policies and regulations for strengthening the sustainable crop production intensification value chain. **FAO’s Save and Grow³ paradigm** provides a menu of interventions that countries and partners may deploy in context-specific settings to engender a sustained resilience of national crop production and protection systems.

1. **Farming systems:** Crop production intensification should be built on farming systems that offer a range of productivity, socio-economic and environmental benefits to producers and to society at large. Farming systems should be implemented using the seven recommended management practices: minimum soil disturbance, permanent organic soil cover, species diversification, use of high-yielding adapted varieties from good seed, integrated pest management, plant nutrition based on healthy soils, and efficient water management. The integration of pastures, trees and livestock into the production system, and the use of adequate and appropriate farm power and equipment, are also key.

³ <http://www.fao.org/3/I2215E/i2215e.pdf>

2. **Soil health:** Soils rich in biota and organic matter are the foundation of increased crop productivity. Actions required to improve current land husbandry practices include establishing national regulations for sound land husbandry, monitoring soil health, building capacity of researchers, extension workers and farmers, and disseminating information and communicating benefits.
3. **Crops and varieties:** Farmers need a genetically diverse portfolio of improved crop varieties, suited to a range of agro-ecosystems and farming practices, and resilient to climate change. Recommended measures include strengthening linkages between the conservation of plant genetic resources and the use of diversity in plant breeding; increasing the participation of farmers in conservation, crop improvement and seed supply; improving policies and legislation for variety development and release, and seed supply; strengthening capacity; revitalizing the public sector and expanding its role; supporting the emergence of local, private sector seed enterprises; and, coordinating linkages with other essential components of sustainable crop production intensification.
4. **Water management:** Sustainable intensification requires smarter, precision technologies for irrigation and farming practices that use ecosystem approaches to conserve water. Knowledge-based precision irrigation that provides reliable and flexible water application, along with deficit irrigation and wastewater-reuse, is a major platform for sustainable intensification. Policies need to eliminate perverse subsidies that encourage farmers to waste water. Increasing rainfed productivity depends on the use of improved, drought-tolerant varieties and management practices that save water.
5. **Plant protection:** In well managed farming systems, crop losses to pests can often be kept to an acceptable minimum by deploying resistant varieties, conserving predators and managing crop nutrient levels to reduce pest reproduction. Recommended measures against diseases include use of clean planting material, crop rotations to suppress pathogens, and eliminating infected host plants. Effective weed management entails timely manual weeding, minimized tillage and the use of surface residues. When necessary, lower risk synthetic pesticides should be used for targeted control, in the right quantity and at the right time. Integrated pest management can be promoted through farmer field schools, local production of biocontrol agents, strict pesticide regulations, and removal of pesticide subsidies.
6. **Enabling policies and institutions:** To encourage smallholders to adopt sustainable crop production intensification, fundamental changes are needed in agricultural development policies and institutions. First, farming needs to be profitable (some countries protect income by fixing minimum prices for commodities; others are exploring “smart subsidies” on inputs, targeted to low-income producers). Policymakers also need to devise incentives for smallholder farmers to use natural resources wisely and reduce the transaction costs of access to credit. In many countries, regulations are needed to protect farmers from unscrupulous dealers selling bogus seed and other inputs. Major investment will be needed to rebuild research and technology transfer capacity in developing countries in order to provide farmers with appropriate technologies and to enhance their skills through farmer field schools.

CONCLUSION

While COVID-19 is the current disruptive force, we also need to build resilience to economic shocks, climate change, land degradation, biodiversity loss, water scarcity, and pests and diseases. It is time to turn this crisis into an opportunity to move us towards a better “new normal”, i.e. to transform current cropping systems to more sustainable and resilient ones that have the ability to reduce risks and vulnerabilities to multiple threats, and to absorb, adapt and

recover in a timely manner. Any global response to the COVID-19 crisis must include farmers and designate crop production as one of the vulnerable yet essential services.

In the long term, policy environments must support farmers and production systems to address risk reduction, prevention, contingency planning, emergency response and long-term resilience. A few countries have begun to limit grain exports. As a result, staple prices can be expected to increase and countries that are net food importers will need to refocus efforts on increasing crop production, in both quantity and diversity, and crop production capacity by empowering farmers and allowing freer movement of labour for this essential sector. Farmers will need access to inputs and machinery and will also need to be able to implement measures that will stabilize supplies of food to consumers.

The Plant Production and Protection Division of FAO stands ready to work with Member Countries, farmers' organisations and development partners in our efforts to stabilize food production and distribution during this COVID-19 crisis.

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This brief was developed by FAO's Plant Production and Protection Division (AGP). For further information, please visit <http://www.fao.org/agriculture/plant-production-and-protection> or contact: AGP-Director@fao.org.