



The social, cultural & technological impacts of the Covid-19 pandemic in family farming: the case of Washington State

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Executive Summary

About the research

The COVID-19 pandemic has accelerated transformations that we were expecting to happen in decades. The so-called "new normal" gave way to a *covidianity* characterized by structural instability affecting daily life, the fragility of economic systems and political cycles, speeding up technical shifts, and the dematerialization of human activity, caused by the increasing virtualization of a wide diversity of duties and processes. Even when the agricultural economic outlook illuminates some positive scenarios, farming is familiar with the whirlwind of uncertainties and challenges that have exponentially expanded by the dynamics emerging from the pandemic.

Digital technologies catalyze the complex process settled by the pandemic, with cultural, social and technological implications in family farming that this research aims to capture.

The main objective of the project is to identify the impacts of digital acceleration emerging from the pandemic in family farming and its specific challenges and opportunities for agrarian youth. The research followed a qualitative methodological approach, based on semi-structured interviews conducted with agricultors and organizations linked to family farming, living in rural, urban and/or peri-urban areas.

This report presents the main findings of the field work implemented in two selected regions of Washington State, between September-November 2021. As part of the field work, a total of 20 interviews were conducted with small farmers, local markets associations, farming related non-governmental organizations (NGO), libraries, educators and public bodies at the County, State and Federal level.

The study comprises the following two contrasting agro climatic areas (USDA, 2019; Whitt, 2020):

- *Western Washington*: from the Cascade Mountains westward, this territory has a mostly Mediterranean climate, with mild temperatures and wet winters, autumns and springs, and relatively dry summers. This region is characterized by a growing multicultural population, and urban agriculture, a diversified agroindustry including the production of dairy, vegetables, grains, cereals, wood and hops. Driven by an increased interest to consume locally sourced products, particularly in Seattle's Metropolitan Area, it has also become the center of massive consumption and distribution of family farming products. Research

activities were conducted in Seattle, Renton, Lacey, Carnation, North Bend and Puyallup.

- *Eastern Washington*: the part of the State east of the Cascades has a predominant dry climate, in distinct contrast to the west side. It is characterized by a more dispersed population with a relevant presence of latino community, predominant rural culture, agricultural practices focused on harvest, cattle ranching, dairy farms, wheat, apples, pears, cherries and other tree fruits, as well as varieties of grapes and vegetables. Research activities were conducted in the Yakima Valley, including Sunnyside, Spokane, Lyle and Buena.

Key facts about family farming

- Family farming is “a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family capital and labour, including both women’s and men’s. The family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions” (FAO, 2021).
- According to the Food and Agriculture Organization of the United Nations (FAO), it is a predominant form of agriculture both in developed and developing countries: more than 90% of the 570 million farms worldwide are managed by an individual or a family and rely primarily on family labour.
- **Family farms produce more than 80% of the world’s food** in value terms, confirming family farming’s central importance in world food security today and for future generations (FAO, 2021).
- Family farms remain also a key part of US agriculture, making up 98% of all farms and providing 88% of production. Most of those farms are small and they operate almost half of US farmland (Whitt, 2020).
- Agricultural production represents a significant segment of Washington state’s economy. Washington farmers produce over 300 different commodities: apples (22% of the total value of agricultural production in the State), milk (13%), wheat (10%), potatoes (8%) and cattle (7%) are the top five main productions (USDA, 2020).
- In 2019 Washington’s agricultural production totaled \$9.49 billion; food processing generated more than \$21.8 billion in revenues.
- **96% of Washington’s farms are family farms and 89% are small farms** (WSDA, 2021).
- The Washington State Department of Agriculture (WSDA, 2021) identified in 2021 at least 151 farmers markets distributed in 120 towns; King County alone has almost 40 (27%).

Summary of research findings

The COVID-19 pandemic impacts on family farming are characterized by a multiplicity of factors affecting a wide range of activities. Along with economic transformations, this research identified socio-cultural, technological, communicational and generational ongoing shifts affecting management, commercial, logistics, modes of production and interaction that are reshaping contemporary farming.

- The field work detects an ongoing technological intensification of many tools, services and technologies already present in agriculture. For example, during the first two years of the pandemic social media, especially Whatsapp, expanded their influence in family farming and the use of e-commerce increased as small farmers looked for alternative channels to connect with their clients.
- In the last two years, family farms were able to adapt to the emerging dynamics at a faster pace than larger agricultural companies.
- The pandemic deepens the need for digitization, so internet connection is confirmed as a new critical resource in farming, along with other key and historical resources such as soil and water
- While the pandemic brought new opportunities for some small farmers to expand their markets, it also brought into stark relief the pervasive inequities in family farming, especially for those farmers with limited digital access and skills. In this context, the expansion of the digital transformation could set new kinds of barriers to some farm workers without the digital skills required for managing the digital expansion and online business opened as a result of the dynamics emerging from the pandemic.
- The pandemic strengthens the idea that access, use and expansion of ICTs in agriculture face a generational bias. Leveraging their experiential knowledge of the digital universe and extensive use of social media, young girls and boys developed new digital channels and strategies to adapt quickly the family farms to the new “low touch” commercial scenario; also they provided training and technical support to their families to use digital tools and manage the emerging virtual duties. So the crisis confirms the transcendent role of youth in the transition to a new agrarian techno-culture.
- In this context there is a sort of positive reevaluation of the strategic role of young people in farming. They lead and/or influence the adaptation to the crisis unleashed by COVID-19 using ICT to surf the *covidianity*.

Family farming in the emerging “covidianity”

The pandemic has resulted in severe social and economic disruption around the world, including the largest global recession since the “Great Depression” in the 1930s, according to the International Monetary Fund (IMF, 2020). The situation has led to widespread supply shortages exacerbated by panic buying, production and supply-chain disruptions and food shortages. The first year of the pandemic closed with an economic drop of 3.3% in the Global GDP, with a more pronounced fall in Latin America (-7%) and Europe (-6.6%) .

Global growth was at 6.1% in 2021, moderating to 3.6% in 2022 (IMF, 2022). Those projections are stronger than last year, although under review due to the economic effects of the Russia-Ukraine conflict underway. The upward revision reflects additional fiscal support in a few large economies, the anticipated vaccine-powered recovery in the second half of 2021, the decrease in new infections globally, especially in the second quarter of 2022, and continued adaptation of economic activity to subdued mobility. “High uncertainty surrounds this outlook” - IMF experts says (2021) - related to the path of the pandemic, the surge of new variants of the virus - as Omicron was in the ends of the 2021-, the effectiveness of policy support to provide a bridge to vaccine-powered normalization ¹ and the evolution of financial conditions, to name a few.

Social and economic impacts of COVID-19 in the agricultural sector

According to many multilateral organisms, agriculture was moderately affected by the pandemic. In the American continent, the region of the world with more confirmed cases, agricultural exports during the COVID-19 period appear to have been holding up relatively well compared to overall exports. The US Department of Agriculture (USDA) reports that in the first seven months of 2020, agricultural exports were down 3.5% from last year compared to a decrease of 18% for non-agricultural exports (Johanson, 2020). In Latin America, agricultural exports increased 5.4% in 2021 while total exports fell 10.9% (Arias, 2021).

Beyond the numbers, farming is not unfamiliar to the whirlwind of problems, uncertainties and challenges that have exponentially expanded by the pandemic. According to FAO, in the agricultural sector the COVID-19 is setting a high risk of a global

¹ Around 59% of the world population has received a complete scheme of COVID-19 vaccine and 65.1% received at least one dose. Only 15.2% of people in low-income countries have received at least one dose (OWD, consulted on Apr. 25th 2022).

food emergency; in some cases, due to a drop in income and remittances, and in other cases due to the rise in food prices (HLPE, 2020).

Some red alerts were raised as well by the Inter-American Development Bank (IADB) regarding the continuity of the agricultural cycle of smallholders due to liquidity, transportation and lower demand issues. Problems faced by these farmers are particularly important, considering that almost 80% of the productive units are small family farms (IADB, 2021).

The Committee on World Food Security (CFS), an intergovernmental panel promoted by the United Nations, resume the impacts and challenges of COVID-19 in food security and nutrition in the following five ongoing dynamics affecting agriculture, agro-industry and food systems around the World (HLPE, 2020):

- **1. Supply chain disruptions.** There have been major disruptions to food supply chains in the wake of lockdown measures, which have affected the availability, pricing, and quality of food. Labour-intensive food production has also been especially affected by COVID-19 among food system workers.
- **2. Global economic recession and associated income losses.** The resulting drop in purchasing power among those who lost income has had a major impact on food security and nutrition, especially for those populations that were already vulnerable. Those in the informal economy are especially affected. The World Food Programme (WFP) estimates that an additional 130 million people will face acute hunger as a result of the crisis.
- **3. Widening societal inequities.** During the pandemic, the inequities are affecting rights as well as access to basic needs such as food, water, digital connectivity, health care, access to jobs and livelihoods. Many food system workers (mainly migrants) face precarious and unsafe work conditions, which have been exacerbated by the COVID-19 crisis. According to FAO, the agricultural activities of rural women have been affected more than those of men.
- **4. Altered food environments.** Lockdown measures and supply chain disruptions outlined above have changed the context and thus the way people engage and interact with the food system to acquire, prepare and consume food. In the US there was a resurgence of interest in community supported agriculture (CSA) subscriptions, as people increasingly grew concerned about the safety of shopping in supermarkets and desired more direct access to fresh fruits and vegetables.
- **5. Food price increases.** The overall food price index trends mask wide variability in food commodity prices in the wake of the lockdowns. Food price increases resulted from disrupted supply chains that have affected the cost of shipping mainly.

Asymmetrical impacts in Washington State farming

The “Washington State (WA) Farm COVID-19 Impacts & Adaptations Survey” was implemented during 2020-2021, collecting opinions of 265 farmers. This joint work between the University of Washington (UW), the Washington State University (WSU) and the Washington State Department of Agriculture (WSDA) identified an heterogeneous context rising from the pandemic, shaping asymmetrical impacts on farming depending on size, marketing scale, type of production, and other features (Collier *et. al.*, 2021). Among the most prominent impacts identified by the survey (*ibid*) are:

- The most significant COVID-19 impacts reported by farmers are those related to closure of direct sale outlets, ongoing contract discontinuities, production waste and disruption of distribution systems.
- 60% of respondents said their business had been negatively impacted overall by COVID-19, and 30% said the overall impact had been positive.
- 39% of farmers indicated a decrease in revenue of up to \$50,000 in 2020 compared to 2019. Revenue changes for smaller farms (those grossing less than \$250,000 annually) were about evenly mixed with 45% experiencing revenue decreases and 43% experiencing revenue increases in 2020 compared to 2019.
- Operation costs increased for nearly 2/3 of farms.
- Different farms made different changes to production, while many others encountered obstacles to change: 44% of farms increased production and 29% of farms decreased production in 2020 compared to 2019. More than half of farms made at least one change in type, amount, or timing of production in response to COVID-19.
- Some farms reduced their workforce, some couldn't find workers.
- Sales shifted towards direct to consumer and food hubs, away from farmers markets, direct to restaurant, and direct to international. So customer relationships were strengthened for many farms marketing locally and regionally.
- The majority of aid applications were approved; larger farms were more successful than smaller farms.
- There are many concerns for the future, mixed with cautious optimism. Unforeseen expenses, processor capacity and supply chain disruptions are top concerns.

Family farming dynamics during the COVID-19: a qualitative insight

The findings of this study emerged from a series of interviews with different agricultural actors and organizations in Washington State, including local markets associations, farming related non-governmental organizations (NGO), libraries and other public bodies at the County, State and Federal level. A total of 20 interviews were conducted in eastern and western Washington State during the fall of 2021 representing a variety of experiences, to trajectories, and strategies of family farms to adapt to the new dynamics caused emerging from the pandemic.

The scenario presented here is qualitative in nature, which sets it up as an alternative and complementary insight to the predominant economic analysis of COVID-19 impacts in agriculture, published until today.

The information collected allude to much more than just economic impacts of the COVID-19 in agriculture; there are also social, psychological and technological aspects, among others, impacting strongly the dynamics in family farms.

The changes that the family farming sector had envisioned long term were swiftly required in order to survive in the context of the new dynamics emerging from the pandemic. The ongoing transformation illuminates primarily impacts in four main areas:

- **1. Socio-cultural** effects of the pandemic on agriculture, as a complement of the economic impacts, affecting management, commercial and productive practices.
- **2. Technological** frame accelerating some transformations in family farming.
- **3. Communication** modalities were upset because of health restrictions, enabling new social and commercial interactions among agrarian actors.
- **4. Generational** interactions are enabling these transformations and also opening new windows to equity and social inclusion in family farming.

Some enabling factors that fueled this transformation are:

- The high capacity for adaptation and resilience that characterized farmers.
- Swift and required digital transformation opening up a range of activities. - from monitoring productivity to direct customer sales online.
- Integration of banking and ICT into different stages of agricultural activity. For example, Zoom and WhatsApp for communication and coordination among farmers; YouTube for training and for acquiring new knowledge.

- The role of public libraries and NGOs in habilitating internet access for vulnerable communities.
- Socio-cultural changes in society that favored the consumption of local and proximity products.
- The role of youth in leading the digital transformation in family farming.

Socio-cultural changes

More than new technology introduction or new digital uses pathways because of the coronavirus, the research identified an ongoing technological intensification of many tools, services and technologies that were already present in agricultural activities. In other words, the changes emerging from the pandemic are socio-cultural rather than technological.

The farmers' testimonies help to understand the relevance of the socio-cultural impacts reflected by the pandemic, affecting a wide range of agricultural activities: management, marketing, productive practices, labour, logistics, and communication modalities, are among the most mentioned. One of the most relevant impacts of COVID-19 was on the commercialization process from end to end, that needed to be adapted to the new "Low Touch Economy" ² rising from the pandemic, dramatically affecting the nature of the interactions with customers, suppliers, logistics agents, public offices and other critical actors of the agriculture chain.

Although the early stages of the pandemic hit the overall agricultural sector very hard, farmers believe that in general the impacts of the pandemic were not as severe for the specific segment of small farms.

"We had very good sales during the two years of the pandemic. For this year we expected less sales, thinking that the situation will come back to normal, but to our surprise the demand still goes on forward. So We expanded veggie production at this time" (Washington state small farmer, 2021).

Even when they are concerned about the future, many agricultors believe that the transformations that emerged during the pandemic will continue, opening up more opportunities and benefits for small business. Farmers' organizations believe that the pandemic generated a positive change in the consumption pattern of the society which

² The term "Low Touch Economy" refers to the way businesses across the globe have been forced to operate in order to succeed as a result of COVID-19. According to the Board of Innovation (2021), a wide variety of organizations are changing and adapting their management models to mitigate health risks, businesses have been forced to adapt to strict policies, including low-touch interactions, limited gatherings, travel restrictions, and so on. Multiple aftershocks in global markets can already be seen; these include shifts in consumer behavior, new regulations, and supply chain disruptions, that are characteristic of the emerging pandemic's economy model (De Mey & De Ridder, 2021).

could keep high the demand of local and more natural food in the near future, resulting in higher income and positive reevaluation of the small farmers role and its strategic participation in the food chain.

In this transit to the “new normal” or *covidianity* **small family farms were able to adapt to the emerging dynamics at a faster pace than larger agricultural companies.** In a few words, they displayed higher levels of adaptability to the changing markets and to the transformations in social structures, and intergenerational weft that support this specific type of farming structures.

In this adaptation process the small farmers built an ecosystem of material and immaterial resources that helped them to survive during the crisis and to cross the first two years of the pandemic. The field work in eastern and western Washington detected a quick reaction of some family farmers since the first lockdown, adapting their commercial and production circuits and practices, taking advantage of their small size to motorize faster some necessary transformations.

This process was supported by economic resources derived from family savings and, in some instances, governmental emergency financial support targeted to strengthen the marketing channels, design a digital strategy, get trained, go online or add new technology to increase the productive scale. At the same time the course to the *covidianity* also was fueled by critical cultural resources to make come true the changes, as creativity, social empathy, previous experience, resilience and adaptability to uncertain contexts, resulting in more expanded and profitable commercial networks.

“The Pandemic put farmers in crisis overnight. Nobody was expecting that and several ones reacted fast” (Washington state small farmer, 2021).

“Small Farmers are the one of the most adaptable people on the Planet. They fight against the weather, the climate change, the inequities on market access and now they must cross over this crisis in spite of a wide kind of digital connectivity issues that still remain existing in the rural contexts” (Farming NGO, 2021).

“Adaptation and resilience is in the DNA of farmers. And they did it so fast this time” (Farming NGO, 2021).

Technological implications: two accelerations

When the COVID-19 pandemic broke out in early 2020, , much of the world moved online, accelerating a digital transformation that has been underway for decades. Students with at-home Internet access began attending class remotely; many people started working from home; and numerous companies, entrepreneurs and self-employed people adopted digital business models to maintain operations and preserve some revenue flows. Internet traffic in some countries increased by up to 60%

shortly after the outbreak, underscoring the digital acceleration that the pandemic sparked (OECD, 2020).

Focusing on the technological implications of the pandemic in farming, the agricultors' contributions in this research reveal the coexistence of positive and negative effects, materialized in two main types of accelerations emerging from the pandemic:

- **1. Digital acceleration.** As in many other sectors and economic activities, the pandemic expanded the digital transformation in the agricultural sector.
- **2. Inequity acceleration.** It also brought into stark relief the pervasive digital and social inequity that still persists in Washington State today.

The ongoing transformations propelled by the pandemic's digital acceleration, are having higher socio-cultural than technological impacts. All agricultural activities were transformed towards digital, accelerated and forced adaptation towards virtualization of a wide range of activities and processes.

The crisis forced many small farmers to an increase use of financial and banking services as part of their business and to the virtualization of channels of distribution and sales, even when they didn't have the required infrastructure and/or digital skills to make this change happen. So in this context, the COVID-19 crisis has contributed to reducing some barriers to digital technology adoption in farming.

After almost two years of digital intensification of human activity, **the pandemic highlights the transition from soil-based agriculture to data-driven agriculture**, which began decades ago but is now becoming more visible. For decades soil and water were considered the main resources to produce food. Now, more than ever, the internet has become a new critical resource to agriculture, from business management (sales, customers and supplier communications, production inputs) to productive practices (professional and technical support, weather forecast, circulation and logistics, government duties, circulation permits).

"We couldn't wait so long. So We implemented digital strategies quickly. We acknowledged that if we didn't digitize at this time we probably would disappear. Going with our business online was not a very new thing for us, but we should increase digital actions and that's an activity that demands complementary time and effort, so we should better-organize our schedule and reprioritize all our duties. It was a crazy time" (Washington state small farmer, 2021).

However not all farmers are in the same conditions to affront the pandemic digital acceleration. While the crisis brings new and more inclusive opportunities to some small producers, COVID-19 could expand simultaneously the preexistent inequities in farming.

“The Pandemic changed everything. So many people without regular access to the markets and resources had to go forward suddenly with online sales, digital bureaucracy, remote education and other critical activities to their daily lives. That adaptation process was chaotic, and still was. Digitization remains a huge challenge for many small farmers” (Washington state small farmer NGO, 2021).

According to the testimonies collected, the pandemic makes more visible the coexistence of two types of digital inequities: :

- **Inequities in access to quality digital: infrastructure.** In some rural, mainly, and peri urban areas remain lack quality internet access to the internet, sometimes because of poor infrastructure or orographic-type impediments, sometimes due to lack of budget to pay the price of a digital service.
- **Inequities in skills: digital competences.** Many people - aged farmers mainly, predominant in the Washington's agriculture ³ - have physical access to the internet but don't know how to use digital tools and services.

The producers identified public libraries and farmers associations as critical actors to attend to these two gaps during the pandemic, supporting vulnerable communities with internet hotspots and online resources (courses and training, technical support, reading material, tutorials, online resources). In this context, YouTube expanded its influence in farming as a knowledge platform.

“I think that a very positive legacy that left the pandemic was the high interest of so many institutions about rural connectivity and improving internet access in the countryside” (Washington state public library, 2021).

“During the pandemic we saw a high increase of courses offered by the government and universities, from marketing and online sales to farming and agronomy. We took several of them, but also and mainly we resort to the online tutorial to attend to the emerging issues more quickly, you know, the university of YouTube is always there” (Washington state small farmer, 2021).

Reshaping local: new urban-rural networks

While markets, restaurants, and other food distribution channels close or reduce operations to prevent the spread of COVID-19, especially in the first year of the pandemic, farms across the US have expressed interest in open alternative markets channels to survive (NYFC, 2020), mixing in person (neighborhood local markets, delivery

³ According to the USDA Agriculture Census, the average age of Washington State farmers in 2017 was 58.1 years old, up from 57 in 2007.

by subscription, in-farm sales) with remote strategies (e-commerce storefront, virtual farmers markets, online pre-order form, Whatsapp commerce).

The National Young Farmer Coalition (NYFC) identified higher interest of producers in using software platforms that support direct sales to consumers in their communities since the pandemic began. As a direct consequence of those strategies, reactions to the COVID-19 have quickly increased interest in buying local food and restaurant alternatives. Farmers across the country have turned to the alternative sales models to help them meet their local demand (NYFC, 2020).

The interviews conducted in Washington State confirm this trend; farmers and associations reported sales increasing in local farmers markets, even when they didn't implement online sales or pre-sales:

- In response to COVID-19 restrictions, **King County** farmers markets re-created many ways of doing business. While 30 of the 40 King County farmers markets were open in 2020, many opened later. Every farmers market operated with new signage requiring social distancing (King County, 2021).
- The **Snoqualmie Valley** farmers (SSV, 2020) coordinated an integration with local markets in the Seattle area, but also reopened, with higher social participation, several farm stands following the community supported agriculture (CSA) format. All those strategies drove some sales increases of up to 35%, reported by the farmers interviewed.
- While social events and direct contact with consumers were scaled back to support COVID-19 safety measures, the **Yakima Valley** farmers and organization looked for strong opportunities for community members to engage and support local businesses. The local farmers markets of that vast area of eastern Washington report a 100% increase in participating businesses. Also average vendor sales per day increased 42% (DAY, 2021).

The pandemic led to a positive revalorization of local markets and proximity production, the so-called “last mille food”. The small farmers interviewed remarked the emergence of new opportunities for direct connections with society during the pandemic, in terms that today they have more clients and access to new markets than before of COVID-19.

“Consumers respond quickly when local markets go virtual. During the pandemic we saw more people with a special sensibility to buy local, connecting with small farmers' culture, local food and nearby markets” (Washington state small farmer NGO, 2021).

In this kind of “low touch” strategy (De Mey & De Ridder, 2021) deployed by farmers to reconnect with the pandemic's society, social media, particularly WhatsApp and to a lesser extent Instagram, expanded influence in the farming sector. Also Zoom - and

some other related platforms - emerged as a new service to sell or to stay in touch with customers. **Farmers-consumer networks were highly expanded, opening more direct and new disintermediated bridges between rural-urban environments.**

"We are happy to see that people are now more connected with what they eat. Finally society recognizes the social value of farming in their daily life" (local farmer market association, 2021).

"We felt more community support since the Pandemic. Consumers now are demanding more social media interactions and more quickly replies than before" (Washington state small farmer, 2021).

Reimagining youth as strategic actors in family farming

According to the field work, the pandemic strengthens the idea that the access, use and expansion of ICT in agriculture accepts a generational bias. Adults farmers interviewed recognize the transcendental role of youth in the transition to a new agrarian techno-culture.

"Sons, daughters and nephews helped their parents to adapt their lives to the virtual world during the pandemic. We saw youth about 25-30 years old, mainly, strongly contributing to better-understand online meetings, a wide range of digital procedures or banking operations" (Washington state public library, 2021) .

So there is a sort of positive reevaluation of the strategic role of young people in farming. Social looks evolved from the notion of youth just as a demographic bonus for the generational shift in agriculture to critical enabling actors in the digital transit to one of the most ancient human activities to the interconnected world.

Farmers and organizations agree that **young people have strengthened their relevance as socio-technical and intergenerational intermediaries in a new expansion of the agrarian techno-culture.** They lead and/or influence the adaptation to the crisis unleashed by the COVID-19 using ICT to surf the *covidianity*: their voice and actions are becoming more powerful in the decision-making process.

"There are still many people in agriculture resisting the digital transformation. The pandemic doesn't change this situation because young people are filling this digital void. Youth are entering into the managing process of farms, in some cases for the first time, and their parents are discovering and rethinking the relevancy of them in the family organization" (local farmer market association, 2021).

Family farming in Washington State: the road forward

The interviews conducted with different social actors related to family farming in eastern and western Washington throw up pathways, dynamics and trajectories emerging from the exceptional crisis of the COVID-19 pandemic.

Mapping farming from the social and human sciences, specially from the qualitative method and the complexity, open a wide range of variables impacting on agriculture. So the resulting scenario sits at a crossroad between the multiple concerns shared by the interviewees, helping to reconstruct and identify the main issues and challenges settled by the pandemic, as a possible way to take a look at the farming's future agenda.

According to the interviews, the ten main concerns to watch more closer in the short and middle term are:

- **1. Labour.** Supply chain disruptions are accelerating the workforce crisis in agriculture present even before the pandemic; now this is an issue for small farmers as well - not only for medium and large farms as usual - because they are increasing their production due to more social demand for local food. Expansion of the digital transformation could set a new kind of barriers to some farm workers without the digital skills required for attending the digital expansion and online business opened since the pandemic began.
- **2. Production adaptation.** COVID-19 is impulsing a reorganization of the productive chains and not everyone in family farming is able to adapt their farms to the *covidianity*. Many farmers had difficulties adapting their facilities and practices to the sanitary measures required by public agencies; while others couldn't afford (either financially and/or digital competences wise)) the digital transformation accelerated through the pandemic. The farms better positioned to afront this scenario would be the one who has been able to adopt ICTs more intensively in a short time.
- **3. Digital divide.** During the pandemic the digital divide becomes more evident, when it is not also expanding. Especially the second gap (skills / competences) is now more critical to attend.
- **4. Digital infrastructure.** The Pandemic deepens the need for digitization, so internet connection is confirmed as a new critical limiting condition for cultivating, along with other key and historical resources such as soil and water. The rural digital connectivity emerged as a relevant interstice in a State home of

two technology giants. While the digital transformation is becoming more influential and increasingly permeating agricultural activity, broadband in rural areas is an absolute necessity in these challenging times.

- **5. Price rising.** The demand for local food is increasing and therefore prices are rising. This issue directly affects the participation of low- and middle-income sectors in local markets, and also their access to local and quality food.
- **6. Sustainability.** Some organizations are concerned about the environmental pressure due to the agricultural production increase to attend the rising local food demand.
- **7. Instability.** High volatility impairs short- and medium-term planning for all kinds of farmers, whatever its productive and economic scale. Official measures change all the time and that brings a lot of instability to the agricultural business.
- **8. Housing.** Due to the pandemic, people who live in cities look at rural areas with greater interest, especially for residential purposes, although mixed with some small-scale productive projects. This has altered the housing dynamics in some rural locations, increasing the price of houses and causing new problems for residents and producers who rent land for cultivation.
- **9. Hybrid consumption model.** Now that many activities return to the presentiality, it is very challenging how to continue with part of the old and new normals working together. Consumers value face-to-face spaces, they ask for them, but simultaneously they require online alternatives / services and intensive digital communication to stay closer. It is like a double condition that consumers demand today from local markets.
- **10. Vaccination.** Vaccination is shaping a new dynamic of interactions in the agrarian world and is becoming an open front for controversy and dispute. Some farmers and organizations warn of resistance to working with unvaccinated people. This affects re-employment, also interactions with consumers and suppliers.

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