

# Food Supply Resilience and Migrant Workers

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## Summary

The Covid-19 pandemic disrupted economies and labor markets, including sectors such as agriculture that employ internal and international migrant workers. The resilience of the supply of farm workers, its ability to recover from and adapt to unexpected shocks, was cushioned in the short term by making exceptions to lockdown regulations, such as exempting essential workers from stay-at-home orders and allowing temporary migrant workers to cross otherwise closed borders to fill seasonal farm jobs.

This paper explores the resilience of agricultural subsectors that rely on migrant workers, laying out short- and medium-term options to increase their resilience to a pandemic or similar shocks. In the short term, when the demand for labor is relatively fixed or inelastic, the major options are to induce local workers to substitute for missing migrant workers or to make exceptions to international mobility restrictions and admit temporary migrant workers to fill seasonal farm jobs. In the medium term, governments can influence the demand for migrant workers by subsidizing or taxing labor-saving mechanization, raising or lowering the cost of temporary migrant workers, and using trade policies to encourage or discourage imports of labor-intensive commodities.

## Introduction

Temporary migrant workers are found near the top and bottom rungs of the job ladder, from scientists and engineers to care givers and farm workers. Temporary migrant workers at the top of the job ladder were often able to work remotely during the Covid-19 pandemic of 2020, while some temporary migrant workers employed in bottom-rung jobs were deemed essential and expected

to continue to provide care, harvest commodities, and perform other tasks that are difficult to do remotely.

The first section of this paper explores the evolution of employment in food production. In industrial countries, the supply of local farm workers declined faster than the demand for them over the past several decades, encouraging governments to allow the entry and employment of legal temporary migrant workers and, in many countries, to tolerate quasi- and un-authorized farm workers. In the care sector, by contrast, the demand for workers rose faster than supply due to aging populations. Care worker wages were often suppressed (e.g. through regulation) in order to avoid rising costs of care provision, resulting in workforce gaps filled in part by migrants.

Middle-income developing countries present a more complex picture. Countries such as Brazil and Mexico, which are major exporters of agricultural commodities, rely on internal migrants from poorer areas to fill seasonal farm jobs in the richer areas that include most export farms, and they did not impose Covid-19-linked controls on internal migration for essential work during the pandemic. Countries such as Malaysia and Thailand have long relied on temporary migrant workers from poorer countries to fill farm, fishing, and forestry jobs, and they allowed those who were in-country to stay longer due to border closures that sometimes prevented temporary migrant workers from returning to their countries of origin, effectively freezing migrants in place (Issara Institute, 2020).

The second section of the paper examines government policies to prevent the spread of Covid-19, employer and worker responses to these policies, and the compromises

that allowed continued production of labor-intensive commodities during the pandemic in 2020. With the demand for farm labor relatively fixed in the short term, and when local workers were unable or unwilling to fill seasonal farm jobs, most governments extended temporary migrant worker visas and opened their borders to new and returning temporary migrant workers. Most farm workers were given documents by their employers that testified to their essential status to enable them to travel during periods when stay-at-home orders were in effect.

The third section of the paper asks how resilience in the food system could be strengthened. There are three major options to respond to the declining supply of local manual labor in agricultural systems: mechanization, imports, and recruiting temporary migrant workers. As laid out below, each option poses trade-offs between competing goods, has distributional consequences for winners and losers, can be implemented over different time horizons, and has different implications for systemic resilience.

Government policies that subsidize labor-saving mechanization favor large farmers who have the capital to adopt mechanized systems, which accelerates the consolidation of food production on fewer and larger farms and increases resilience because “machines do not get sick.” Increasing imports of labor-intensive commodities can reduce the value of land in destination countries as farmers switch to less labor-intensive and lower-value commodities, raise land values and create jobs abroad, and increase food security and safety risks. Admitting more temporary migrant workers provides substitutes for missing local workers but can also slow mechanization and increase problems of worker exploitation.

## Migrant Sectors

Agriculture, the production of food and fiber on farms, is the keystone of the larger food system that includes industries such as the seed and fertilizer firms that supply production inputs to farmers and the farm-related output sector comprised of firms that process and distribute food and fiber to consumers.<sup>1</sup> The share of a country’s workers

employed in agriculture is a key marker of economic development. In industrial countries, the production of farm commodities is concentrating on fewer and larger farms.<sup>2</sup> Richer countries have a large number of farms, but many are hobby or retirement operations that produce relatively little food. Farming in many industrial countries obeys the 80-20 rule, i.e. the largest 20 percent of farms produce 80 percent of total farm output (McDonald et al, 2018).

Many large farms are operated by families that use labor-saving equipment to produce field crops such as wheat or corn or specialize in animal commodities such as milk or hogs. Some field crop and animal operations hire year-round workers, but most seasonal workers in industrial countries are in the subsector of crop agriculture that produces fruits and nuts, vegetables and melons, and horticultural specialties that range from flowers to mushrooms. In the United States, these so-called FVH commodities account for a relatively small share of farm sales (a sixth) but employ over half of all farm workers and almost all migrant and seasonal farm workers.<sup>3</sup>

A billion people around the world are employed in farming.<sup>4</sup> Most of them (600 million) are subsistence farmers who produce food for their own families in developing countries or operate hobby and retirement farms in industrial countries. Most of the world’s 400 million hired farm workers are employed on the larger farms that account for most of the world’s farm output.<sup>5</sup> The International Labour Organization estimates each country’s share of employment in agriculture, industry, and services, and reported that agriculture’s share of world employment fell from 43 percent in the early 1990s to 26 percent in 2017, decreasing by 0.5 percent or about 50 million a year.<sup>6</sup>

Agriculture’s declining share of employment often obscures the rising share of employment within agriculture that is accounted for by hired workers. The ILO reports that hired workers are 40 percent of average agricultural employment globally, but hired workers are the majority of average agricultural employment in many industrial countries, especially in the FVH subsector. The National Agricultural Workers Survey has found for the

<sup>1</sup> Employment in the US food system is summarized at:

<https://migration.ucdavis.edu/rmn/blog/post/?id=2405>

<sup>2</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2136>

<sup>3</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2303>

<sup>4</sup> The World Bank reported that 28 percent of the world’s 3.6 billion workers were employed in agriculture in 2010.

<sup>5</sup> Pigot (2003) estimated that 35 percent of the then 1.3 billion people employed in agriculture were wage or hired workers, some 450 million. The hired labor share of people in agriculture has been climbing as the total number of people in agriculture declines.

<sup>6</sup> World Bank data: <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS>

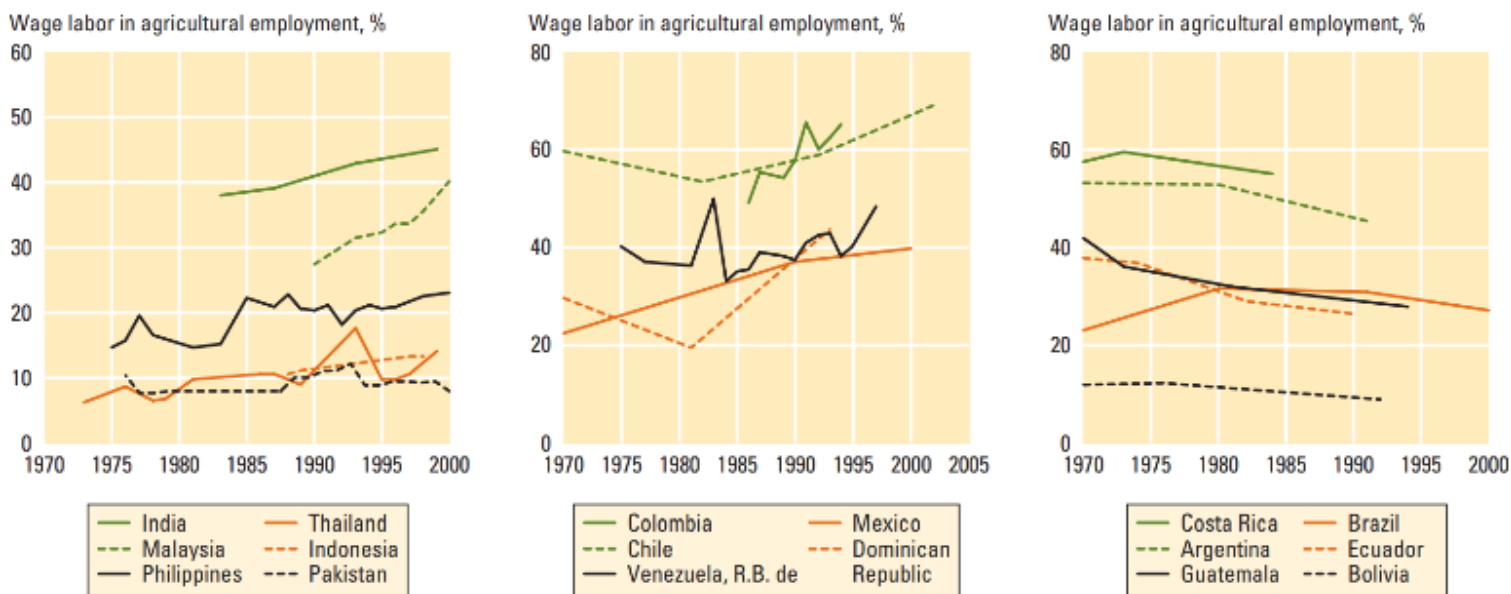
past three decades that about 70 percent of hired US crop workers were born abroad, typically in Mexico. Even though most are unauthorized, they are mostly settled in the US with US-born children and typically work for one farm employer during the year.<sup>7</sup>

Figure 1 shows how the share of hired workers in agricultural employment has changed over time in selected countries. These data are available for only some countries and for periods between 1970 and 2005, but they highlight cross-country differences in shares of hired farm workers. The left panel includes Malaysia, a major exporter of palm oil and rubber whose hired farm workforce includes many temporary migrant workers. The number of farmers and family members is declining, raising the share of hired and temporary migrant workers among those who are employed in Malaysian agriculture from 30 percent to 40 percent between 1990 and 2000. By contrast, Pakistan's four major crops, cotton, rice, wheat and sugar cane, are mostly produced on family farms and consumed domestically, helping to explain why the share of hired workers remained at 10 percent between 1975 and 2000.

The middle panel of Figure 1 includes several Latin American countries that export fresh fruits and vegetables, such as Chile and Mexico. The share of wage workers in Chilean agriculture has been high for decades, and rose during the 1990s, while the share of wage workers in Mexican agriculture almost doubled between 1970 and 2000 from 20 percent to 40 percent.<sup>8</sup> Chile is a major exporter of fresh fruit during the winter months in the northern hemisphere and wine and seafood year-round, while Mexico is the world's largest exporter of avocados and fresh tomatoes.

The right panel of Figure 1 includes several countries that have been major agricultural exporters for decades, Costa Rica, Argentina, Brazil,<sup>9</sup> and Ecuador. In these countries, the share of hired workers in agricultural employment fell after 1970, in some cases due to more mechanization, as with Brazil's coffee and sugar sectors. Brazil is one of the few countries that is bringing new farmland into production, adding farmers and hired workers in the Amazon and midwestern Cerrado areas.

**Figure 1. Share of Hired or Wage Labor in Selected Countries' Agriculture**



Source: World Bank World Development Report 2008, p. 206

<sup>7</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2435>

<sup>8</sup> A profile of workers employed on Mexican farms that export fruits and vegetables is at: <https://migration.ucdavis.edu/rmn/blog/post/?id=2367>

<sup>9</sup> Brazil's major agricultural exports are coffee, soybeans, beef, sugar cane, ethanol, and frozen chickens.

A prosperity paradox affects hired labor in agriculture. The share of a country's workers employed in agriculture falls as per capita incomes increase, so that rising incomes and declining employment on farms are among the surest signs of economic development. However, as agricultural employment shrinks, the most capable workers are the first to exit the farm workforce, and the “people left behind” to fill seasonal farm jobs often lack the skills and contacts needed to find nonfarm jobs.<sup>10</sup> These domestic workers are often joined by legal and unauthorized migrants from poorer countries in the farm labor market.

The prosperity paradox highlights the fact that the same economic growth that raises per capita incomes and concentrates farm production on fewer and larger farms is often accompanied by more vulnerable hired farm workers. Government policies in industrial countries often protect the incomes of farm owners, whose average incomes are therefore relatively high compared with incomes in other sectors. On the other hand, labor and migration policies in industrial countries often make exceptions that allow for temporary migrant workers and keep wages in agriculture low.

In sum, the share of the world's workers employed in agriculture is falling, but the share of hired or wage farm workers is rising. These hired workers are local workers unable to find nonfarm jobs and migrants from poorer countries. The availability of hired farm workers at relatively low wages encourages more production of labor-intensive commodities on fewer and larger farms that enjoy economies of scale, so that FVH factories in the fields may employ thousands of workers during peak harvest seasons.

### **Covid-19 Responses**

Governments reacted to the Covid-19 pandemic in February and March 2020 by ordering non-essential businesses to close and people to stay home. Most governments closed their borders to non-essential travel, but kept borders open for imports and exports of goods. Food production was deemed essential, so farmers and farm workers, as well as workers employed in farm output industries such as logistics and supermarkets, continued to work. The largest employer in the food system, the hospitality sector, was largely closed, idling millions of food preparation workers, chefs, and servers.

Unemployment rates rose in spring 2020 just as agricultural employment began its seasonal increase in the northern hemisphere. Many European governments announced programs to encourage jobless hospitality and other workers to fill seasonal farm jobs (Mitaritonna and Ragot, 2020). Some local workers expressed interest in seasonal farm jobs and began to work, but a combination of farm employer preference for migrant workers, local worker reluctance to agree to remain in farm jobs for longer periods, and government exceptions that permitted the entry of migrants meant that most of the seasonal farm jobs that were filled by migrant workers in 2019 were also filled by migrants in 2020 (World Bank, 2020). In Canada and the US, temporary migrant worker programs expanded in 2020 despite high jobless rates.<sup>11</sup>

The first major lesson of the Covid-19 pandemic involves the difficulties involved in persuading jobless local workers to fill seasonal farm jobs under current wages and working conditions. Farmers in 2020 often received lower prices for fruits and vegetables due to the closure of restaurants and food service operations, while fewer shopping trips by consumers reduced the demand for fresh produce. Lower prices and higher costs for personal protective equipment and cleaning made farmers reluctant to raise wages or take other steps to attract and retain local workers.

One exception to the rule of few changes to wages and working conditions after the pandemic may be meatpacking, a food-related nonfarm industry. There were Covid-19 outbreaks in meatpacking plants staffed by migrant workers in many countries, perhaps because workers are close to each other on “dis-assembly” lines in cold and sometimes wet environments that allow the virus to linger.<sup>12</sup> Covid-19 spread quickly in some meatpacking plants, including among migrant workers who shared housing. The US government responded to covid-19 outbreaks in meatpacking by deeming them essential businesses subject only to federal oversight, frustrating local health authorities who wanted to close plants with a large number of infections. Some European governments promised to end the practice of allowing contractors to provide meatpackers with migrant workers from lower-wage countries.

The first two responses to Covid-19 in agriculture, few local workers and few fundamental changes in wages and

<sup>10</sup><https://migrationfiles.ucdavis.edu/uploads/farm-labor/2018/05/14/MartinGuzman.pdf>

<sup>11</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2444>

<sup>12</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2434>

working conditions, may nonetheless prompt a third response over time, labor-saving automation. Some of the meatpacking and other food-processing firms rely on new waves of foreign-born workers to staff plants with thousands of employees announced plans to speed up efforts to replace workers with machines. For example, Tyson Foods employs 122,000 US workers to process 20 percent of US chicken, beef, and pork. Covid-19 spurred Tyson's Manufacturing Automation Center to speed the development of labor-saving machines.<sup>13</sup> Chickens are more uniform than beef cows and hogs, but consumer preferences for deboned and skinless chicken has added employees in processing plants that Tyson is trying to replace with deboning machines that are expected to be competitive with hand workers within five years.

The shift of butchering from supermarkets to slaughterhouses near where animals are raised, which occurred in the US in the 1980s and 1990s, is an example of moving food preparation from often unionized and skilled workers in cities to less unionized and less-skilled workers in rural areas (Champlin and Hake, 2006). There may be more farm-to-fork changes as a result of Covid-19, such as moving more meal preparation from home to restaurant kitchens and delivering ready-to-eat meals.

### **Increasing Resilience**

The food system in industrial countries proved remarkably resilient to the Covid-19 pandemic, exposing few gaps in the retail supply of farm commodities. The early days of the pandemic in industrial countries featured more stories of farmers dumping commodities they could not sell rather than of consumers pining for unavailable labor-intensive commodities. There were short-lived limits on the quantities of fresh meat and milk that consumers could buy in some countries, but the food supply chain proved resilient in keeping most fresh foods in stock as food consumption shifted from a mix of away from home and at home meals to be mostly at home.

There are three major options to increase the resilience of relatively labor-intensive farming over time, that is, its ability to supply fresh fruits and vegetables despite unexpected disruptions to the supply of seasonal workers. The first is labor-saving mechanization that makes FVH farming less dependent on hand labor. A relative handful of commodities employ most of the hired workers in rich

country agriculture; the big five in the US are apples, oranges, strawberries, lettuce, and tomatoes.

Mechanizing the harvest of these commodities is hard for several reasons, including non-uniform ripening. Selective harvesting is much more difficult than harvesting all of the commodity in one pass through the field, which explains why the harvesting of annual vegetable crops is more mechanized than the harvesting of perennial fruits. Harvest machines can destroy annual vegetable plants, but machines that harvest fruit from trees must not damage the tree or dislodge immature fruit (Calvin and Martin, 2010).

Catch-and-shake harvesters remove all of the fruit and nuts from trees in one pass through an orchard, using a rubber-coated machine head that grasps the trunk or limb and delivers a jolt to dislodge the fruit or nuts. Humans can distinguish mature and immature fruits and vegetables much more efficiently than machines that must locate the commodity, determine its maturity, and harvest it without damaging the plant.

A major question for mechanizing the harvest of more fruits and vegetables is whether to focus on uniform ripening to facilitate once-over harvesting or to develop machines that can locate and pick selectively, so that they can make multiple passes through fields and orchards. The trade-offs involve losing marketable fruit with once-over harvesters versus more expensive machines for selective harvesting machines that make multiple passes. Marketers are not sure whether consumers will accept more damage in machine-harvested commodities, or whether supermarkets will add hand- and machine-picked options to their current conventional and organic produce sections.

The second option for increasing systemic resilience in agriculture deals with temporary migrant workers. Should governments accept the need for migrant farm workers and reduce barriers and costs for the employers who want migrants, or raise the cost of migrants to encourage mechanization and to ensure that employers try to employ local workers? Almost all governments have a hire-local-workers first policy that requires employers to try and fail to recruit local (or, in the European Union, intra-EU) workers before receiving certification to employ migrant workers. This recruitment exercise rarely finds local workers, prompting employers to argue that governments should allow them to simply attest to their need for

<sup>13</sup> <https://www.tysonfoods.com/news/news-releases/2019/8/new-facility-boost-tyson-foods-automation-and-robotics-efforts>

migrants. Worker advocates, on the other hand, argue that employers who are seeking certification to hire migrants do not want to hire local workers because the migrants are preferred workers.<sup>14</sup>

Reducing the cost of temporary migrant workers would encourage farmers to hire more. The alternative is to raise the cost of migrant workers over time by tying farm wages to nonfarm wages or introducing levies on migrants that aim to reduce employer dependence over time. Raising the cost of migrants would likely eliminate some producers who do not have the capital required for labor-saving alternatives and make imports from lower wage countries more competitive. Policies on temporary migrant workers therefore affect whether and how farming becomes more resilient. Anderson, Poeschel, and Ruhs (2020) argue that systemic resilience requires rethinking labor migration policies in order to support the provision of essential goods and services in the medium term.

The third option is to encourage more imports of fresh fruit and vegetable commodities for which employers cannot find local workers. About 20 percent of the world's \$5 trillion a year worth of farm output is traded across national borders, usually between industrial countries.<sup>15</sup> Trade in fresh fruits and vegetables has been rising, in part due to investments by producers and marketers from richer countries in poorer countries. For example, half of the fresh fruit consumed in the US, and a third of the fresh vegetables, are imported, and Mexico is the source of half of US fresh fruit imports and three-fourths of US fresh vegetable imports.<sup>16</sup> Mexico's export agriculture is closely connected to US agriculture, since most of the capital and inputs on Mexico's export farms are from the US.

There is a final consideration in food system resilience: is all food essential? People need food to survive, but do they need labor-intensive commodities such as fresh berries that employ large numbers of migrant workers? Should consumers be expected to switch to canned or processed fruits and vegetables during crises such as pandemics or should governments make exceptions to admit migrants to preserve the supply of fresh fruits and vegetables? Admitting migrants helps growers who produce fresh fruits and vegetables, while encouraging consumers to shift to commodities not dependent on migrants helps

those who process fruits and vegetables, emphasizing the distributional effects of government definitions of which foods are essential.

There was little debate about the hierarchy within the essential economy during the Covid-19 pandemic, but there could be such a debate during future emergencies if, for example, temporary migrant workers came from disease hotspots. Dealing with the resilience of food systems requires not just an examination of the role of temporary migrant workers, but also thinking about priorities within the food system.

### Conclusion

The food system proved to be remarkably resilient during the Covid-19 pandemic of 2020. The production of most labor-intensive commodities continued at year-earlier levels despite significant changes to consumer demand with stay-at-home orders and labor supply disruptions. Most governments made immigration exceptions for temporary migrant workers, seeming to accept the argument of employers that local workers will not fill seasonal farm jobs.

There are three major lessons of the Covid-19 pandemic for the resilience of labor-intensive agriculture. First, the foreign-born workers who dominate among seasonal workers are more likely to be displaced by machines or imports than by jobless local workers. There is a wage at which local workers would fill most seasonal farm jobs, but long before this wage is reached, machines or imports would replace hand workers.

Second, the Covid-19 pandemic is accelerating trends already underway. The race in the fields is between machines, temporary migrant workers, and imports. Each poses challenges and opportunities, as with the increased concentration of production on fewer and larger farms with mechanization versus the difficulty of protecting temporary migrant workers who fill seasonal farm jobs as their number expands.

Third, increasing food system resilience requires weighing trade-offs. How important is food security and food safety, and are these enhanced if food is produced within national

<sup>14</sup> There may be some options that are win-win for migrants and employers without dealing with local versus migrant workers. Governments could give experienced migrants multi-year visas and eliminate the need for yearly trips to consulates for visas, so that migrants could fly from their homes in Mexico to

US farm jobs rather than first travel to US consulates in Mexico and then travel in buses to US workplaces

<sup>15</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2365>

<sup>16</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2404>

borders? Then Mexican President Salinas in 1990, when arguing for approval of NAFTA, said that the US can accept Mexican tomatoes or Mexican tomato pickers (Escobar et al, 2019). Three decades later, over half of US fresh tomatoes are imported from Mexico,<sup>17</sup> and there is relatively little unauthorized Mexico-US migration to fill US farm jobs. Fresh tomato production in California and Florida has fallen by over half in the past three decades.

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*Views expressed in this publication reflect the opinion of individual author(s) and not those of the European University Institute.*

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## References

- Anderson, Bridget, Friedrich Poeschel, and Martin Ruhs. 2020. Covid-19 and Systemic Resilience: Rethinking the Impacts of Migrant Workers and Labour Migration Policies. EUI Working Paper. <https://hdl.handle.net/1814/68235>
- Calvin, Linda and Philip Martin. 2010. The US Produce Industry and Labor: Facing the Future in a Global Economy. USDA. Economic Research Report No. (ERR-106). November. <https://www.ers.usda.gov/publications/pub-details/?pubid=44766>
- Champlin, Dell and Eric Hake. 2006. Immigration as industrial strategy in American meatpacking. Review of Political Economy. Vol 18. No 1. <https://doi.org/10.1080/09538250500354140>
- Escobar, Agustin, Philip Martin, and Omar Starbridis. 2019. Farm Labor and Mexico's Export Produce Industry. Wilson Center. [www.wilsoncenter.org/publication/farm-labor-and-mexicos-export-produce-industry](http://www.wilsoncenter.org/publication/farm-labor-and-mexicos-export-produce-industry)
- Issara Institute. 2020. Responsible Management of Workforce Reduction in Thailand in the COVID-19 Environment. [https://44f2713d-a205-4701-bba3-8d419653b4b6.filesusr.com/ugd/5bf36e\\_34aab1eb28ad4541ad40f8ba6ae4504c.pdf](https://44f2713d-a205-4701-bba3-8d419653b4b6.filesusr.com/ugd/5bf36e_34aab1eb28ad4541ad40f8ba6ae4504c.pdf)
- MacDonald, James, Robert Hoppe, and Doris Newton. 2018. Three Decades of Consolidation in US Agriculture, USDA, ERS, EIB-189. <https://www.ers.usda.gov/publications/pub-details/?pubid=88056>
- Mitaritonna, Cristina and Lionel Ragot. 2020. After Covid-19, will seasonal migrant agricultural workers in Europe be replaced by robots? CEPII Brief 33. [http://www.cepii.fr/PDF\\_PUB/pb/2020/pb2020-33.pdf](http://www.cepii.fr/PDF_PUB/pb/2020/pb2020-33.pdf)
- Pigot, Mami. 2003. Decent Work in Agriculture. Prepared for ILO Symposium. April 30. [http://www.ilo.org/wcmsp5/groups/public/---ed\\_dialogue/---actrav/documents/publication/wcms\\_111457.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---actrav/documents/publication/wcms_111457.pdf)
- World Bank 2020. Potential Responses to the COVID-19 Outbreak in Support of Migrant Workers. <http://documents1.worldbank.org/curated/en/428451587390154689/pdf/Potential-Responses-to-the-COVID-19-Outbreak-in-Support-of-Migrant-Workers-June-19-2020.pdf>
- World Bank Data. 2008. World Development Report 2008: Agriculture for Development. <https://doi.org/10.1596/978-0-8213-6807-7>

<sup>17</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2436>

