## 1AC — Plan

#### Plan text: The United States ought to recognize an unconditional right to strike for agricultural laborers by amending the National Labor Relations Act to extend the definition of ‘employee’ to include agricultural laborers.

#### Squo NLRA fails to protect farmer’s rights to strike – plan amends the NLRA to collectively bargain

Reilly, 11, Penn State Law, “Agricultural Laborers: Their Inability to Unionize Under the National Labor Relations Act”, Penn State: Masters of Science, JD Law, URL: <https://pennstatelaw.psu.edu/_file/aglaw/Publications_Library/Agricultural_Laborers.pdf>, 2011 + since most recent citation is from then, KR

The NLRA gives workers “freedom of association, self-organization, and designation of representatives of their own choosing” in order to equalize the bargaining power between employers and employees in the hopes of limiting the interruptions to the free flow of commerce.10 The statute covers a large number of workers based on the broad definition of “employee,”11 but excludes from coverage all agricultural laborers.12 The NLRA does not define who these agricultural laborers are that are excluded from the right to organize, but rather Congress has instructed the National Labor Relations Boards (NLRB)13 in the annual Appropriations Act that in determining who is an agricultural laborer excluded from the NLRA, to rely on the definition of “agriculture” found in the Fair Labor Standards Act (FLSA).14 Agriculture in the FLSA is defined as “farming in all its branches ... and any practices ... performed by a farmer or on a farm as an incident to or in conjunction with such farming operations...”15 The definition also lists specific activities to further define what would specifically be considered agricultural work.16 Therefore, workers whose responsibilities are contained in the FLSA’s definition of “agriculture” are excluded from the right to organize and form unions under the NLRA.

The reasoning behind this exclusion is somewhat vague, especially considering that the bill originally proposed in the Senate did not exclude agricultural laborers from the definition of “employee.”17 There is not much mentioned about the agricultural exclusion because of the statute’s primary focus on addressing problems in the industrial sector. There is, however, a debate from in the House addressing the agricultural laborer exemption,18 where an argument was made that agricultural laborers should be included because they needed the same protections as industrial workers. Agricultural labor issues were brought to light in 1935 after governmental investigations into child labor issues and the lack of clean water provided for such workers.19

In response, two possible reasons were briefly mentioned that may explain why agricultural laborers were excluded: first, in regions like the Midwest, farms are mostly family farms and should not be within the scope of the NLRA, and second there was a concern that Congress did not have jurisdiction over agricultural workers because it was questionable whether such workers were engaged in interstate commerce.20 Many commentators believe that it was the former argument that led to the exclusion of agricultural workers from protection under the NLRA. Another possible reason for this exclusion as presented by some commentators is that the larger farms lobbied to have their workers excluded from the NLRA.21 While not expressly stated, the most likely explanation is that Congress wanted to protect the family farmer from having to pay higher wages that unions would inevitably demand of the employers.22 Realizing that agriculture was important to the entire nation, Congress wanted to shield this industry from unionization, and wanted to protect the family farmer from having to pay what they could not afford. Congress did not think it necessary to equate the family farmer with big business.

The broad definition of “agriculture” under the FLSA would seem to exclude from the NLRA any worker who is employed by any agricultural entity. This is not the case, however, because the Supreme Court has adopted a two-part test to determine if an employee is in fact an agricultural laborer excluded from the NLRA.23 An agricultural employee will be excluded from the right to organize if he or she is engaged in either primary or secondary farming. The Supreme Court has taken the FLSA definition of agriculture and essentially limited its application based on a strict application of the statutory language. Primary farming are those tasks specifically referred to in the statutory definition of “agriculture” such as “cultivation and tillage of the soil [and] dairying.”24 The rest of the definition is considered secondary farming, and therefore a worker is an agricultural laborer if the work performed is of the type that would be performed “by a farmer or on a farm as an incident to or in conjunction with such farming operations.”25

In one of the more recent cases to address the question of who is considered an agricultural employee, the Supreme Court in Holly Farms Corp. v. N.L.R.B. upheld the determination made by the NLRB that workers on live-haul chicken crews do not engage in agricultural labor and therefore are not subject to the agricultural exception from the NLRA.26 The responsibility of the live-haul crew is to enter the farms of independent contractors who raise chickens supplied by Holly Farms; the chickens are then caught and caged by nine chicken catchers, moved by a forklift operator onto a truck to be transported by a truck driver to the processing plant.27 These live-haul crews were not engaged in primary farming because primary farming would have been the actual raising of the poultry, which was the responsibility of the independent contractors, not the live- haul crews.28

The court then focused on whether these live-haul crews were engaged in secondary farming. In doing so, the court immediately found that that the work performed by the live-haul crews were not of the kind “performed by a farmer” because Holly Farms gave up its farmer status as soon as the chicks were delivered to independent contractors for raising.29 As a result of this determination, the truck drivers were not considered agricultural laborers and were therefore not part of the agricultural exception to the NLRA and were able to unionize.30

The court then looked to whether the chicken catchers and forklift operators were engaged in work “on a farm as an incident to or in conjunction with” raising poultry.31 The Supreme Court found that neither the chicken catchers nor the forklift operators “worked on a farm” because the work these employees performed were part of Holly Farms’ poultry processing operations and was not of the type of work contemplated to be included in the statutory definition of “farming.”32 The Supreme Court adopted the reasoning of the NLRB in deciding that the catchers and forklift operators were not performing work “incident to or in conjunction with” the farming operations of the independent contractors.33 In doing so, the Supreme Court decided that it was more important to look at the status of the employer as a farmer rather than where the laborer carried out the responsibilities of the job he or she was hired to perform. Because, as previously determined, Holly Farms was not considered a farmer by the time the live- haul crews went in to catch the chickens, the catchers and the forklift operators were not engaged in secondary farming as defined in the FLSA.34 This meant that all the members of the live-haul crews were not agricultural laborers and therefore all had the right to organize under the NLRA.

The Supreme Court limited the applicability of the definition of “agriculture” in Holly Farms and in doing so opened up the possibility that more workers employed by large, vertically integrated employers would be able to organize.35 By taking the approach to look at the status of the employer rather than where the work is performed, the Supreme Court broadened the already broad definition of “employee” under the NLRA. More employees working for these vertically integrated employers will be able to experience the protection of the NLRA that has been open to industrial workers since the act was first passed in 1935. The impact of the Holly Farms decision is for courts to engage in an in depth analysis before deciding whether a worker is an agricultural laborer not protected by the NLRA. Switching the focus to the status of the employer rather than where the employees are performing their responsibilities will ensure greater protection for workers and a broader reach of the NLRA.

While the definition of “employee” has expanded to include some employees who are employed by agricultural employers, there is still the exception for agricultural laborers included in the statute and therefore there are still many workers who are unable to form unions. These may be the workers that need the most protection because they are the field workers who are subjected to abuse, poverty and hazardous working conditions.36 Many commentators would like to see the NLRA extended to include agricultural laborers. The main advantage to extending the definition of “employee” to include agricultural laborers under the NLRA is that the statute has been in existence for many years, and most of the challenges that would be brought up with respect to agricultural laborers attempting to unionize have most likely already been resolved in other employment sectors allowing the NLRB and courts to rely on precedent. This will make application of the statue to the agricultural laborers consistent with other employment sectors. Reliance on precedent would lead to predictable outcomes when labor disputes arise. Agricultural laborers still have a ways to go before they will be able to reap the benefits of the NLRA; but, if this were to happen, agricultural laborers would be able not only to unionize and have their association protected, but also would have the advantage of being able to rely on others with experience and knowledge of the NLRA and its intricacies.

### Advantage - Yield

#### Farmer’s yield is nearing an all-time low – government support doesn’t help the most needy and isn’t a long term solution

Farm-Aid, 20, 9/14/20, “Understanding the Economic Crisis Family Farms are Facing”, 2Farm Aid works with local, regional and national organizations to promote fair farm policies and grassroots organizations coordinating campaigns designed to defend and bolster family farm-centered agriculture. RL: <https://www.farmaid.org/blog/fact-sheet/understanding-economic-crisis-family-farms-are-facing/>, KR

EVEN BEFORE COVID-19, FARM FAMILIES HAD NEGATIVE FARM INCOME

Things have been bad in farm country for a while. Between 2013 and 2018, farmers experienced a nearly 50% drop in net farm income as the prices for corn, wheat, dairy, beef and other farm products crashed. While net farm income rose by 3% in 2019, government payments accounted for all of that increase (namely, via the trade bailout program). Without it, 2019 delivered farmers their second lowest income since 2013.[13]

As for 2020, while the U.S. Department of Agriculture (USDA) is forecasting a $19 billion (or 22.7%) increase in net farm income this year, government payments like trade bailouts and federal COVID-19 relief programs account for 36% of net farm income — the highest share since 2001 and the eighth highest share since The Great Depression.[14] Without the $22.4 billion provided in government payments, net farm income in 2020 would be well below the sector’s average from 2000 to 2019.[15] What’s more, the vast majority of payments flowed to the very largest farms. CNBC reports that the top 5% of trade bailout recipients received nearly half of all $28 billion paid in 2018 and 2019.[16]

Perhaps more troubling is USDA’s pre-pandemic data. In February, USDA forecast 2020 median farm household income at -$1,840 — meaning that farm households would lose money from the farm.[17] More recent USDA data suggests a slightly better median income level,[18] presumably from high levels of government payments. But even these sector-wide income numbers likely mask severe distress in many parts of farm country, as many farmers who have been squeezed by years of low income did not benefit from federal payments. Most farmers rely on off-farm jobs to feed their families, secure health insurance, and keep their farms afloat. Given the pandemic’s broader economic impacts, which arrived after farmers have had to dig into their savings for the better part of the last decade, droves of farms are at risk of going under in the next year.

FARM CREDIT CONDITIONS WEAKEN

Farmers rely heavily on credit to buy the seeds, fertilizer, machinery, livestock and other inputs that keep their farms running. Because most farmers require operating loans at the start of each season, a critical aspect of a farm’s financial health relates to its ability to make loan payments on time. Economists utilize various solvency measures to measure this, including the debt-to-asset ratio, debt-to-equity ratio and equity-to-asset ratio. All of these measured weakened for the eighth consecutive year in 2020. As farm debt continues to rise, the sector’s risk of insolvency in 2020 is at its highest level since 2002.[19] The following trends reveal weakening credit conditions for farmers and ranchers in today’s strained economy:

Farmers struggle to make loan payments. Farm loan delinquency rates are rising. The Federal Reserve Bank of Kansas City, which covers Colorado, Kansas, Missouri, Nebraska, New Mexico, Oklahoma and Wyoming, reports that the volume of delinquent farm real estate and operating loans increased by about 17% and 13%, respectively, over the past year.[20] Meanwhile, the Federal Reserve Bank of Chicago, covering Illinois, Indiana, Iowa, Michigan and Wisconsin, reports the share of farm loans with “major” or “severe” repayment problems is now at 8.3% — a level not seen since 1988.[21]

The 1980s all over again? Pre-COVID-19, total farm debt was estimated to hit a record $425 billion, just shy of the 1981 peak of $440 billion.[22] Since 2014, real estate debt has been rising to historic levels, potentially indicating not just rising land values, but farmers refinancing higher-interest loans or other debt into farm real estate. In a time of persistently low farm income where farmers are defaulting on loans, this trend places a lot of farmland at risk of liquidation.[23]

Growing demand for credit: If farmers can’t secure affordable and timely credit, they face an economic uncertainty that threatens the survival of their farms. Several bankers are reporting growing demand for loans, yet significant decreases in both the number and the size of agricultural loans in their portfolios.[24]

While economists and lenders note that federal relief has helped farmers navigate these conditions, many remain concerned that without more intervention, a wave of foreclosures will strike farm country. These conditions are challenging for all farmers, but beginning farmers, smaller and midsized farmers, as well as other disadvantaged farmers in particular continue to struggle.

#### The aff is key to increase incentives to farm: it increases wages, sets safe living conditions, AND helps farmers expand products

Reilly, 11, Penn State Law, “Agricultural Laborers: Their Inability to Unionize Under the National Labor Relations Act”, Penn State: Masters of Science, JD Law, URL: <https://pennstatelaw.psu.edu/_file/aglaw/Publications_Library/Agricultural_Laborers.pdf>, 2011 + since most recent citation is from then, KR

The rate of pay agricultural laborers earn in return for their work would increase if these workers were able to organize and engage in collective bargaining with their employers. Agricultural workers in 2008 made between $8.64 per hour and $13.02 per hour.50 The hourly wage is relatively low, especially when compared to other occupations with the ability to unionize that require similar training and working conditions. For example, construction laborers in 2008 earned between $10.80 and $14.95 per hour51 and textile, apparel and furnishing workers earned between $9.14 and $18.15 per hour.52 While there is a wide range of earnings for anyone entering these three professions, the two professions that are able to unionize earn more per hour on a national level than the agricultural workers who are exempted form organizing under the NLRA. The low earnings of agricultural laborers as compared to other laborers supports a finding that the NLRA would benefit agricultural laborers and are the type of workers that were meant to be extended the right to organize. If agricultural laborers were afforded protection under the NLRA to engage in collective bargaining, the likely result would be that bargaining representatives would be able to negotiate with agricultural employers for higher wages that would lead to less of an earnings gap between agricultural laborers and laborers in other industries.

There is one major similarity between the construction industry and the agriculture industry that would seem to tip the scales in favor of affording agricultural laborers the right to unionize under the NLRA. That is that both industries hire seasonally.53 The seasonal nature of agricultural work is often cited as a reason against unionization, but with the similarity in the construction industry and the ability of those workers to unionize, the seasonal nature of agricultural work should be a factor in considering whether or not to include these workers under the NLRA, but is not itself conclusive. If seasonal workers in other industries are able to unionize, the seasonal nature of agricultural work should not be a major point of opposition to allowing agricultural laborers the right to collectively bargain.

Agricultural laborers are also subject to harsh conditions because of the work that they perform and should be able to organize under the NLRA in order to bargain with their employers for better working conditions. Agricultural laborers are not always provided with access to clean drinking water nor are there typically adequate restroom facilities for these workers to use.55 Unions can help workers to gain access to sanitary facilities and clean drinking water by bargaining for these necessities with the employers.56 By making these issues part of a collective bargaining agreement, unions will be able to hold employers contractually liable to follow such conditions and will thereby improve the conditions of employment for agricultural laborers who would otherwise be subject to sub-standard facilities.

Another hazardous working condition that arises for agricultural laborers is the exposure to pesticides. Agricultural laborers may be exposed to pesticides that are carcinogens or other pesticides that affect the endocrine and/or hormone systems.57 Agricultural laborers, especially those who apply pesticides, are at a greater risk of acute pesticide poisoning which many times is more prevalent than it needs to be because agricultural employers do not take the kinds of precautions necessary to prevent pesticide poisoning.58 Unions again can aid agricultural laborers by limiting such exposure through a collective bargaining agreement because unions would be able to bargain for certain safety precautions to be taken before workers are able to spray pesticides and can also ensure that safety gear is provided before spraying commences. Inadequate facilities and pesticides are two examples of the hazardous conditions that agricultural laborers are exposed to that could be cured through the right to unionize and collectively bargain with employers. Unions would be able to protect workers from such sub-standard conditions which in turn would lead to less illness and disease that agricultural laborers would be subjected to and would increase productivity on farms because field workers will not be slowed by sickness and would be able to work more as a result.

Further, “farmers, planters, ranchmen, dairymen, nut or fruit growers” are able to form associations for the mutual benefit of all members.59 These associations allow their members to work collectively in preparing their products for market.60 These producers are also able to form cooperatives to market their products and maintain the “bargaining position of individual farmers” in order to prevent adverse consequences of overcrowding the market.61 These agricultural producers are free to engage in concerted activity for the mutual protection of the association’s members, but agricultural laborers are exempt from asserting these same rights.62 Agricultural producers are therefore able to become even stronger entities, further widening the differences in the bargaining positions between producers and agricultural laborers. The unionization of agricultural laborers would better equalize the bargaining position on each side affording laborers the protections they need against agricultural employers as they become more powerful through associations.

#### 3 Distinct links:

#### 1] Productivity – Wages don’t destroy consumer spending AND create economic value

Jayachandran, 20, 6/18/2020, New York Times, “How a Raise for Workers Can Be a Win for Everybody”, Seema Jayachandran is an economics professor at Northwestern University, URL:<https://www.nytimes.com/2020/06/18/business/coronavirus-minimum-wage-increase.html>, KR

Two new studies show that giving pay raises to low-wage workers is good for consumers, too. That finding could add momentum to efforts to help grocery store clerks, nursing home workers and delivery drivers who are being paid a minimum wage despite their efforts being so essential during the current pandemic. The new research shows that raising the minimum wage improves workers’ productivity, which translates into businesses offering higher-quality service. Because many customers are willing to pay more when quality improves, a company can raise its prices without losing sales volume. That means that profits need not suffer even though employee salaries increase.

Moreover, because companies are getting better performance from workers in return for paying them more, a higher minimum wage does not necessarily lead to fewer jobs. With a more productive work force, more economic value is being created and there is more money to go around, so a higher paycheck for one person does not imply another person’s loss.

The federal minimum wage of $7.25 an hour has not increased since 2009, though Democrats in the House of Representatives have tried to raise it. State and local governments can set their own minimum wage, provided that it is above the federal rate. For example, Ohio’s minimum wage is $8.70 an hour and New York state’s is $11.80. San Francisco’s is $15.59 an hour.

The two new studies, one focused on nursing homes and the other on department stores, looked at the effects of minimum wage changes made at various levels of government. While they are both still working papers and have not appeared in scholarly journals, they were conducted rigorously, by my estimation, and the evidence they offer deserves consideration in the debate on the minimum wage, particularly during our current health and economic crises.

The nursing home study, by the economist Krista Ruffini, a visiting scholar at the Minnesota Federal Reserve, has direct implications in the current pandemic. The improvements in quality it found may be a very a big deal: They imply fewer medical complications and, perhaps, a longer life for patients.

Ms. Ruffini analyzed hundreds of increases in the minimum wage across the United States from 1990 to 2017. In each case, she compared employment in neighboring counties that suddenly had different minimum wage levels.

Her method expands on a landmark study by David Card, an economist at the University of California, Berkeley, and Alan Krueger, the former presidential adviser and Princeton economist, who found no drop in fast-food employment when New Jersey raised its minimum wage in 1992 above the level paid across the state line in Pennsylvania.

Similarly, Ms. Ruffini found little change in employment levels in nursing homes. Many employees were paid the minimum wage or somewhat more than that. Even in cases of the workers — nursing assistants — who had been paid more than the minimum wage, an increase in that base wage rippled through the labor market and still raised their salaries.

Rivian edges closer to an I.P.O., seeking a valuation above $50 billion.

PG&E says it faces a federal inquiry and $1.15 billion in losses over the Dixie fire.

The Biden administration will publish vaccine mandate rules ‘in the coming days.’

Ms. Ruffini’s most startling finding was that higher minimum wages reduced mortality significantly among nursing home residents. Her research suggests that if every county increased its minimum wage by 10 percent, there could be 15,000 fewer deaths in nursing homes each year, or about a 3 percent reduction.

How did pay increases translate into better patient health and longer lives? It appears that with better pay, jobs in nursing homes became more attractive, so employee turnover decreased. Patients benefited from more continuity in their care.

In addition, the better paid employees may have simply worked harder, perhaps because they cared more about holding onto their jobs. Economists say they have been paid an “efficiency wage”: Employees become more productive when their wages are higher.

The higher wage may also have attracted more skilled or industrious people to the job, but this seems to account for at most a small portion of the improvements in patient health.

#### Prefer the only empirical study from a country

Katovich, Maia, 18, 1-4/2018, “The relation between labor productivity and wages in Brazil:”, Scielo Brazil, University of Wisconsin-Madison, Madison, Wisconsin, Universidade de Campinas, Campinas, São Paulo. URL: <https://www.scielo.br/j/neco/a/QR5hfyMfL9c3gwQSGGcRyHD/?lang=en>, KR

In Brazil, real wages grew significantly more than did labor productivity between 1996 and 2014. However, this general trend disguises significant sectoral variations, which can be grouped into four conceptual trends. Firstly, in the agriculture and commerce sectors, large gains in labor productivity were accompanied by real wage increases and improvements in the quality of employment. This dynamic was likely due to a positive interplay between productivity-enhancing market developments (incorporation of new technologies, high levels of investment, exploitation of new consumer markets/agricultural frontiers) and income-enhancing institutional developments (formalization and minimum wage valorization). In conjunction, these forces resulted in productivity gains that outpaced wage growth, leading to declining relative wages in agriculture and commerce (see Appendix A for data on relative wages).

In a second sectoral trend, the construction and real estate and other services sectors enjoyed real wage gains over the 1996-2014 period, despite stagnation in labor productivity. Both sectors offer little natural room for drastic productivity growth through the incorporation of new technologies, investments, or practices. And both were major beneficiaries of institutional interventions such as formalization and valorization of the minimum wage.14 Together, these forces resulted in a sharp rise in relative wage for construction and real estate and other services.

In a third variation of the productivity-wage relationship, both labor productivity and real wages largely stagnated or declined slightly in the industry and transportation sectors. In the case of industry, international competition likely held down wages, while productivity suffered from ongoing processes of deindustrialization. By its nature, the transportation sector offers little room for major productivity gains, while the average wage may have fallen as a result of changing forms of employment relations (i.e., increasing levels of self-employment) and increasing relative costs of transport (Chahad; Cacciamali, 2005). These dynamics explain the moderate decline in relative wages for industry and transportation.

In a fourth and final trend, the financial and information services and public services sectors saw stable or declining levels of labor productivity, accompanied by increasing or stable real wages. Productivity declines in financial and information services were due largely to changes in the Brazilian banking system over the 1998-2004 period. Earnings increases in both sectors may have resulted from persistently high returns to education, growing demand for qualified workers, and high levels of labor organization. As a result, the relative wage rose sharply for these sectors between 1996 and 2014.

It is important to note that all analyses above should be interpreted with caution, due to the difficulty inherent in estimating absolute values of labor productivity for some sectors, particularly public services and real estate. Nevertheless, the values serve to elucidate temporal dynamics of labor productivity within (if not necessarily across) sectors, revealing essential patterns in the productivity-wage relationship.

Estimation of hierarchical wage models using pooled data assessed the main structural and individual determinants of real wages over the sample period. Growth in sector- and state- level labor productivity was significantly positively associated with growth in real wages for all economic sectors from 1996 to 2012. Elasticity between labor productivity and real wages was greatest for sectors where workers’ earnings are often based directly on productivity (real estate, commerce), or where firms can easily measure employees’ productivity (industry). Elasticities appear smaller in sectors where productivity is more difficult for firms to measure, or where there are high levels of minimum wage employment (agriculture, construction) or labor organization (financial and information services).

In general, productivity’s impact on wages was comparable to the impacts of institutional factors, particularly worker formalization and minimum wage. Formalization, which primarily impacts labor markets through the enforcement of a minimum wage-floor, exhibited the largest impacts on sectors with high proportions of minimum wage employment. Labor organization had varied effects on wage levels. In sectors with high levels of organization, increases in union-participation exhibited a significantly positive association with wages. In contrast, increases in union-participation in less-organized sectors were negatively associated with wages, perhaps because union activity served to draw earnings away from the larger share of non-unionized workers. Nonetheless, unionization changed little over the sample period and exerted a relatively small impact on hourly wages.

Wage growth in line with the first sectoral trend (observed in the agriculture and commerce sectors) may be the most sustainable in the long term, in the sense that increased earnings over the 1996 to 2014 period accompanied real gains in labor productivity. In contrast, rising relative wages in the financial and information services and public services sectors highlight the capacity of labor organization, institutional protections, and skill-biased job polarization to decouple wages from productivity levels. In sum, institutional mechanisms display the capacity to substantially reallocate factor incomes toward workers, but these mechanisms face natural limitations if not accompanied by growth in labor productivity. Thus, sustainable future wage growth in Brazil will likely depend on positive interplays between market-driven productivity gains and continued institutional interventions.

#### That drives economic confidence – Increased productivity drives farm growth which creates a chain of investment.

Wang et. al, 19, “How Farmers Make Investment Decisions: Evidence from a Farmer Survey in China”, Sustainability, Shuangjin Wang 1, Yuan Tian 2,\*ORCID, Xiaowei Liu 3 and Maggie Foley 4, 1: School of Management, Tianjin University of Commerce, Tianjin 300134, China, 2: School of Economics and Management, Beijing Jiaotong University, Beijing 100044, China, 3: College of Business, St. Ambrose University, Davenport, IA 52803, USA, 4: Davis Business School, Jacksonville University, Jacksonville, FL 32211, USA, URL: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwii17vKue7zAhVdJjQIHUr3D7YQFnoECAUQAQ&url=https%3A%2F%2Fwww.mdpi.com%2F2071-1050%2F12%2F1%2F247%2Fpdf&usg=AOvVaw1RMvM-hGadn_uoetBxebDi>, KR

A variety of research methods were used in previous research to study farmers’ investment adjustment behavior from different perspectives. For example, Factor Analysis [3,7], Multinomial Logit Model [8,10,11], Deterministic Discrete Event Model [9], Mixed Logit Model with Flexible Mixing Distribution [12], Tobit Model [13,14], Probit Model [15–17], and Structural Equation Modeling [18,19].

It is widely accepted that farmers’ investment adjustment behavior is affected by many factors, but different literature has different opinions on key influencing factors that affect farmers’ investment behavior. Adimassu et al. [20] have found that farmers’ investments are limited by their capabilities. Okello et al. [21] have revealed that economic benefits, such as higher yields and income, can affect farmers’ investment in seed selection. Also, the cropped area, scale of the farmland, and agricultural income significantly influence farmers’ willingness to invest [10]. The government’s support and favorable policies can positively promote the agriculture investment of farmers [22,23]. Adimassu et al. [2] finds that farmers’ investment behavior is affected by five major factors: households’ resource endowments, knowledge, and experience of farming, access to information, social capital, and availability of family labor.

Moreover, some economic studies focus on specific factors that affect investment choice, such as state subsidies [24], the impact of agricultural cooperatives [25], risk preferences [26,27], the mode of communal land acquisition [28], government policies [29], and the presence of a price floor [13]. Besides, Ullah and Anad [30] examine the factors that influence the level of agricultural mechanization: economic condition of farmers, the land tenure system, scale of farmland, cost of fuel, and the cost of renting agricultural machinery. Konrad et al. [15] have found that the scale of farm operations, environmental concerns, and innovation readiness are important for farmers’ technology investments.

Factors such as the effect of planting structure adjustment and the output elasticity of capital can affect the investment adjustment behavior of farmers, and have been investigated by some studies. Ji et al. [31] have found that the shortage of a labor force can be supplemented by increasing capital input. In addition, other reasons may also lead to investment adjustment behavior such as attitudes toward capital input [4], the amount of agricultural income [32], expected financial benefits from capital input [33], and differences in adjustment capabilities [34].

#### 2] Capital Investment; Boosting wages creates incentive to invest

Duke, 16, 9/2/2016, “To Raise Productivity, Let’s Raise Wages”, Center for American Progress, Brendan Duke: Princeton University; MPA in Economic Policy, Macalester; B.A. nin political science, Associate Director for Economic Policy, Senior Policy Analyst for US Congress Joint Economic Committee, URL: <https://www.americanprogress.org/issues/economy/reports/2016/09/02/142040/to-raise-productivity-lets-raise-wages/>, KR

Gordon argues that a key reason productivity surged during this period was that rising real wages provided an incentive for firms to invest in capital, such as machinery. When labor is cheap, businesses have little incentive to invest in capital because they can always hire another worker on the cheap. But higher wages reduce the price of capital relative to labor, nudging firms to make investments and raise productivity.

The 1929–1950 increase in wages was at first a result of several policies that directly raised workers’ wages, including the first federal minimum wage, the first federal overtime law, and the National Labor Relations Act, which made it easier for workers to join a union and bargain with their employers. The entry of the United States into World War II further drove investment higher, as the economy converted into what Gordon describes as a “maximum production regime.”

It is striking that during this period of rapid productivity growth, wages for production workers grew even faster than productivity growth did. The current debate about whether a typical worker’s compensation has kept track with the economy’s productivity typically envisions productivity growth as the precondition for wage growth. But Gordon’s research implies that the relationship can go both ways: Not only can productivity growth raise wages, but higher real wages also can boost productivity growth—the main reason for slow gross domestic product growth—by giving firms a reason to purchase capital.

Can higher wages raise productivity growth in 2017? Basic economic theory and common sense suggests that an increase in the price of labor—wages—achieved through higher labor standards will cause firms to invest in more capital, raising the economy’s productivity.

Some have tried to use this fact to claim that raising wages ultimately will hurt workers by causing them to be replaced with machines. But automation is just another way of saying productivity growth: Robots replacing humans means more output produced using fewer human hours—the literal definition of higher productivity. We can either have a productivity problem or an automation problem, but we cannot have both at the same time.

The sharp slowdown in productivity growth today heavily implies that we currently have too little automation rather than too much. At the same time, the evidence on policies that raise wages—such as the minimum wage—points to no noticeable effect on employment. Indeed, the New Deal and its rising labor standards were also a period of rapid employment growth.

A more important question is whether we have enough of the other key ingredient for the productivity growth that made the 1930s possible: innovation. Technological change itself is another reason firms purchase new capital—otherwise, investment amounts to “stacking wooden ploughs on top of wooden ploughs.” Gordon makes clear that the 1930s were in fact one of the most innovative decades in history, as the economy began to harness the potential of the internal combustion engine and electrification. Firms ultimately could afford policies that raised wages because they could raise their productivity with new equipment featuring innovative technology.

There exists a vigorous debate today about whether we live in a period of very ordinary or extraordinary innovation. Some—such as Gordon himself—argue that productivity growth inevitably will be slower because today’s new technology is inherently less innovative than that of the 1930s. In that case, there still exists a strong justification for raising labor standards: Slow productivity growth makes it that much more important that its fruits be shared equitably.

But others—including Andrew McAfee and Erik Brynjolfsson of the Massachusetts Institute of Technology, the country’s leading growth optimists—argue that we live in a period of extraordinary technological change. Even so, recent innovations—such as 3-D printing and social media—have failed to raise productivity growth, even after accounting for the possible problems with how statistics measure it. Therefore, it may be the ability of firms to hire workers at wages that have barely grown since 2000—rather than purchasing new equipment and adopting new technology—that has prevented productivity from rising.

The truth likely falls somewhere in between the pessimists and the optimists, with healthy—if not necessarily explosive—productivity growth possible. In that case, policies that raise wages may be the key to unlocking productivity growth by increasing incentives for firms to invest in capital. Such wage-raising policies include making it easier for workers to bargain collectively, raising the federal minimum wage, and modernizing overtime rules. Fortunately, the Obama administration recently has taken action on the latter and proposed an increase in the overtime threshold to $47,000 per year.

#### 3] Working conditions – squo legislation allows for loss of rights but only unions and the right to strike solve

Apha, 17, 11/7/17, “Improving Working Conditions for U.S. Farmworkers and Food Production Workers”, American Public Health Association, The American Public Health Association (APHA) is a Washington, D.C.-based professional organization for public health professionals in the United States., URL: <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2018/01/18/improving-working-conditions>, KR

More than 4 million workers in the United States are directly involved in tending crops and livestock, picking and packaging produce, and slaughtering and processing meat, poultry, and seafood.[1] These individuals, referred to throughout this policy statement as farmworkers and food production workers, are essential to meeting the public health goal of ensuring an accessible supply of nutritious food. Yet, in the case of many of these workers, their job adversely affects their health. Most are paid low wages, and they suffer high rates of work-related fatalities and injuries. Many face discrimination and exploitation because of their race, ethnicity, and/or immigration status, and some are excluded altogether from certain labor law protections. Currently, working conditions for farmworkers and food production workers contribute to health disparities. As expressed in APHA policies, a sustainable food system must be grounded in safe working conditions, fair wages, and human rights protections for individuals employed in agriculture and food production.

Fatality, injury, and illness rates: Workers employed in food production jobs are exposed to a wide range of serious hazards. For example, workers on dairy farms and in hog growing operations are at risk of being injured by charging or kicking animals and by contact with heavy machinery[2], workers who handle livestock and poultry are at increased risk of zoonotic diseases[3], and those who tend and harvest crops often suffer heat-related illness,[4] pesticide poisoning,[5] and chronic back and shoulder injuries from bending, reaching, and lifting.[6] Workers employed in seafood, poultry, pork, and beef slaughtering and packaging suffer from lacerations and amputations, infections and exposure to antibiotic-resistant pathogens,[7,8] and musculoskeletal disorders caused by intense repetitive work.[9,10] Exposure to such hazards results in high injury and fatality rates among U.S. workers employed in these industries.

The rate of fatal work-related injuries among agricultural workers is seven times higher than the rate among workers overall and two times higher than that for construction workers and those employed in the mining industry.[11,12] In addition, the rate of nonfatal work-related injuries is significantly higher among workers in food production jobs, particularly with respect to incidents requiring days away from work or restricted duty (DART).[11] The meatpacking and poultry industries rank among the U.S. industries with the highest rates of work-related injuries and illnesses, with DART rates in these industry sectors at 7.8 per 100 workers and 4.6 per 100 workers, respectively, as compared with the national rate of 1.7.

Work-related injuries, illnesses, and disability are costly to businesses, communities, governments, workers, and workers’ families. The annual cost of work-related injuries, illnesses, and fatalities in the United States, including productivity losses, is estimated to be $250 billion. With workers’ compensation covering less than 25% of these costs, all members of society share the burden.[13] As a result, families and taxpayers subsidize the majority of the lost income and medical care costs generated by work-related injuries and illnesses.[14]

Economic insecurity: Income is a critical social determinant of health. It affects individuals’ and families’ ability to meet the basic needs of safe housing, food, child care, transportation, and health care.[15] The hourly wage for meat, poultry, and fish processing workers ranges from $9 to $16, with 50% of the individuals employed in these occupations earning less than $25,000 per year.[16] In 2013–2014, the average wage reported by farmworkers was $9.71 per hour. Thirty percent of farmworkers had family incomes below the federal poverty level.[17]

Depending on the industry sector, the size of the employer, and the presence of a union, some food production workers have access to employer-provided health insurance and paid sick leave, but many do not. In 2014, for example, only 22% of farmworkers reported having health insurance. Although most workers employed by the major U.S. meat and poultry processing firms are provided health insurance, most do not have the benefit of paid sick leave.[18,19]

Workers in certain agricultural jobs are paid according to the amount of product harvested. This system may result in a higher weekly wage for some, but it encourages an intense pace of work that involves repetitive tasks, heavy loads, and other risk factors for injuries.[20] For instance, one study showed that Latina farmworkers who were employed under piece-rate contracts were five times more likely to report an injury than those who did not work in a piece-rate system.[21] The piece-rate system fosters discriminatory practices and inequality[22] and can be abused by employers and supervisors to defraud workers of the wages they are due.[23] Farmworkers consistently report that the only way to increase and ensure the use of safety equipment will be switching from the piece-rate system to an hourly wage rate.[19]

Jobs with low wages and the lack of employer-provided health insurance and paid leave put a strain on social safety net programs.[24] In a Labor Department survey of agricultural workers, only 14% reported having employer-sponsored health insurance, while 37% reported that their family used government-provided health insurance.[16]

Exclusion from labor protections: There is a long history of agricultural jobs in the United States being excluded from labor protections, including Occupational Safety and Health Administration (OSHA) standards, minimum wage and overtime protections, collective bargaining rights, and workers’ compensation insurance.[25] For more than four decades, Congress, through its annual appropriations process, has specifically prohibited OSHA from enforcing any regulations targeting farming operations that employ 10 or fewer workers. Of the more than 100 safety and health regulations adopted by OSHA, only six address hazards specific to agriculture. Moreover, despite high injury and fatality rates among farmworkers, at least 15 states do not require agricultural employers to carry workers’ compensation insurance.[26]

Regulatory protection of agricultural workers from pesticide exposures is the responsibility of the U.S. Environmental Protection Agency (EPA). The EPA’s Worker Protection Standard (WPS) is one of the few occupational health and safety regulations administered by the agency and its designated state regulatory agencies. The EPA revised and strengthened the WPS in 2015 in an effort to achieve parity in regulatory protection for agricultural workers, requiring annual pesticide safety training, notification of pesticide applications, use of personal protective equipment, restricted-entry intervals after pesticide applications, decontamination supplies, and emergency medical assistance. The standard also prohibits pesticide application and early reentry by workers younger than 18 years. In January 2017, EPA published a separate regulation, the Certification of Pesticide Applicators, to improve protections for those who handle, mix, and apply restricted-use pesticides. However, the EPA announced a delay in the effective date for the regulation, influenced perhaps by opposition from some grower organizations, regulators, and pesticide registrants (although this is being contested in court).

Discrimination and exploitation: Agricultural and food production employers rely heavily on immigrants and people of color for their workforce.[27–29] Eighty percent of farmworkers in 2014 self-identified as Hispanic, with about two thirds reporting being born in Mexico. These workers are largely non–English speaking, and nearly half are not authorized to work in the United States.[16,30]

More than 50% of the U.S. dairy workforce is made up of immigrants and refugees.[31] In the top two U.S. dairy-producing states, New York and Wisconsin, more than 75% of dairy workers are from Mexico or Guatemala.[32] In meatpacking and poultry processing, 34% of the workforce is Hispanic, which is more than twice the share of Hispanics in the overall workforce.[33] Refugees from Somalia, Burma, Egypt, and elsewhere are also often employed at meat and poultry plants.[34,35] More than 60% of workers involved in seafood processing, including fish trimming, crab picking, and seafood canning, are foreign-born individuals,[36] including Asian/Pacific Islanders and immigrants from Vietnam, the Philippines, and the Marshall Islands.

Some farmworkers and food production workers are authorized for employment in the United States under the H-2A and H-2B visa programs (these individuals are referred to as “guest workers”). Historically, the jobs covered through these programs have involved laborers tending to and picking crops, but employers in the seafood, poultry, beef, pork, and dairy industries also rely on the programs. As a result of their low wages and harsh working conditions, these jobs are inferior to those held by individuals with other employment options.[37] Because guest workers are tied to a specific employer, they do not have the ability to change jobs if they are mistreated. Investigations by government agencies, journalists, and human rights groups have shown that many individuals with H-2A and H-2B visas are exploited by their employers.[38]

Workers in agricultural and food production occupations are at risk of depressive symptoms and other behavioral health disorders because of low job control and high job strain.[39,40] The high levels of economic stress and employment insecurity they face also have implications for their mental health.[41,42]

Unions serve as a mechanism for workers to negotiate with employers to provide livable wages, health benefits, and safe working conditions. Unions have a positive effect on both unionized workers and non-union workers with respect to wages, fringe benefits, pay inequality, and working conditions.[43] The United Nations Universal Declaration of Human Rights maintains that “everyone has the right to form and to join trade unions for the protection of his interests.” U.S. farmworkers, however, are excluded from the National Labor Relations Act, and thus it is nearly impossible for them to bargain with employers about working conditions. There are certain exceptions (e.g., California, Oregon, Washington) where state laws allow those working in agriculture to unionize. Lack of union representation and protection can result in vulnerable workers remaining silent in the face of exploitation and continuing to work in unsafe conditions.

#### Empirically proven but not denied – unions work in smaller capacities but ONLY an upscale from the plan is key

Bivens, et. al, 17, 8/24/17, Economic Policy Institute, “How today’s unions help working people: Giving workers the power to improve their jobs and unrig the economy”, Josh Bivens is the director of research at the Economic Policy Institute (EPI), Ph.D., Economics, New School for Social Research, B.A., Economics, University of Maryland at College Park, Teresa Kroeger: B.A., Economics and Sociology, Celine McNicholas: J.D., Villanova University School of Law: B.A., Mount Holyoke College, AND MORE, URL: <https://www.epi.org/publication/how-todays-unions-help-working-people-giving-workers-the-power-to-improve-their-jobs-and-unrig-the-economy/>, KR

* Doesn’t disprove uq – a) FUJ was informal and can’t upscale b) didn’t guarantee legal rights but only temporary influence of organizer c) Washington is one of few states where union protections are higher but some make it impossible

Eliminating subminimum wages for farmworkers. In June 2017, Familias Unidas por La Justicia (FUJ) and Sakuma Brothers Berry Farm, one of the Pacific Northwest’s largest berry growers, signed a collective bargaining agreement that ensures good wages for the more than 500 immigrant farmworkers who harvest berries at the farm. The contract ensures that the berry pickers—many of whom had been earning less than the state minimum wage of $9.47 an hour under the former piece-rate system (based on how many pounds of berries they picked)—now earn at least a minimum wage of $12; the revised piece-rate system it establishes seeks to deliver an average wage of $15 an hour. The contract is the culmination of four years of organizing, first as a workers organization and then as a recognized independent union in September 2016. Through strikes, informational pickets, and other efforts, FUJ gained national support for its successful efforts to change a host of practices at the farm, including 12-hour-plus workdays. FUJ also countered Sakuma Brothers’ attempt in 2014 to replace its workforce with workers entering the United States under the H-2A temporary visa program

#### Increasing working conditions key for increased yields and output

Billikopf, 06, 8/11, UC Berkeley, “Managing People on the Farm”, Gregorio Billikopf worked as a Labor Management Farm Advisor with the University of California from 1981 to 2014 (and is now Emeritus). URL: <https://nature.berkeley.edu/ucce50/ag-labor/7labor/01.htm>, KR

To effectively manage a labor force, an employer must be concerned about productivity and also about people. Some farmers are always looking for ways to improve production and ensure the long-term viability of the business. Others operate deteriorated farms and seem to have little interest in increasing yield or in recycling profits into the operation. A manager’s attitude toward farm productivity, especially toward product quality, can strongly influence worker output. Performance is often enhanced when employees believe they are contributing to a valuable product and are part of an effective team.

The connection between employee productivity and farm profitability is direct and obvious. Not as apparent, but just as vital, is the association between concern for worker needs and profitability. How employees’ needs are met has a direct bearing on their performance. Focusing on productivity alone may lead to a reduction in worker output.

A concern for worker needs means attending to their well-being, as both individuals and employees. Courteous and consistent treatment, job security, fair pay, and safe working conditions are important to employees. When those needs are ignored, worker dissatisfaction may impede productivity. One disenchanted employee explained, "When I first worked here, I really exerted myself. But now I try to do as little as I can and still keep my job." Another put it this way, "I’ve learned to give my job the time it deserves, but I no longer give any more of my own time. I’ve been burnt by doing so." A third worker confided, "When I’m mad at the supervisor, I do exactly what she asks me to do ... even if I know a better way of doing something or have a good reason not to do the job her way."

Trust is another important contributor to productivity. Trust builds gradually, as managers and employees learn they can count on each other. Even after workers’ trust has been won, management must continually nurture such trust if they are to retain it. The flow of trust cannot be turned on and off like irrigation water.

Management generally expects personnel to (1) consistently produce high quality work on a timely basis; (2) take their responsibilities seriously, at times even going beyond the call of duty; (3) show concern for the welfare of the farming operation and for other employees; and (4) represent the farming enterprise well within the community.

Employees hope, in turn, that management will (1) value their feelings and opinions; (2) provide positive feedback for work well done; (3) meet the agreed-upon terms and conditions of employment; (4) be consistent and courteous; and (5) provide a work environment where they can develop their potential over time (in terms of skills and earnings).

Understanding Labor Management

Effective labor management demands a clear understanding of its principles and familiarity with its tools. Managers deal with a complex web of interrelated elements. For instance, the wage scale advertised may affect the quality of applicants you recruit; the qualifications of those ultimately hired will in turn determine the amount of on-the-job training needed.

People mistakes may be quite costly. A new worker on a kiwifruit plantation fertilized too close to the plants with a highly concentrated formulation that burned the foliage. Many plants died. The quality of the fruit that did grow was so poor as to be unmarketable through normal channels. Yet another worker mistakenly milked a penicillin-treated cow into the main tank. The good milk in the bulk tank was contaminated and all of it had to be discarded.

These blunders could have been avoided by selecting knowledgeable, skilled personnel, or by providing better orientation, training, management and supervision. Tapping motivation, building effective personal relationships, establishing and carrying out a constructive disciplinary process, and encouraging worker input in decision making are all part of labor management.

There are a number of options available for solving people problems. If we are comfortable using only a few management tools, we may be limited in our response to a challenge. Some, for instance, attempt to use training to solve most any adversity, such as tardiness, misuse of tools, and conflict on the job, whereas others believe that most every difficulty can be solved with pay.

There is a difference between a mistake and a purposeful error. In one vineyard the vines were planted upside down under the direction of an inexperienced supervisor. The ranch manager discovered the error the following spring, when the vines failed to bud out.1 The supervisor’s mistake hurt them not only in terms of lost vine cuttings, but also a year of valuable vineyard development. Until recently, I thought this was just a mistake. A horrible one, granted, but nevertheless human blunder. That is, until I received the following note from a grape grower who had read the above narrative:

"Years ago [when] we were planting our vineyard, the Hispanic supervisor (within the farm labor contractor crew) was imparting his wisdom about crew management. He spoke about their last job at another farming community. Apparently the owner had come out to rant and rave and suggest that the men were slow and stupid. This supervisor told me how he gave that grower the expected humble response of sí (i.e., yes) and then quietly fulfilled the angry growers expectations. At the first moment the owner's back was turned the Hispanic supervisor gained the already watchful crew's eyes; then proceeded to invert a cutting and insert it into the ground. Without a word the entire crew followed his lead and planted the rest of the vineyard with the cuttings upside down. He continued his tale: That grower would have no idea what happened until next year ... and if confronted [the Hispanic supervisor] would just explain that he didn't understand English very well and thought that the grower wanted them to plant those vines the other way ... how was he supposed to know?"2

A clear understanding of management tools includes the proper application of the same. One orchardist, after learning of a neighbor’s success with an incentive program switched his pay system. The peach grower offered crew pickers a full day’s pay—and the right to leave as soon as they finished—if they would pick an additional bin for the day. The pickers were delighted. Most were through before 11 a.m. The farmer was thrilled with the increased productivity. But after the initial excitement wore off he started to feel that the bargain was not so good. He tried to even out matters by asking for yet one more bin per day. The workers, who may have originally accepted the extra bin as a fair exchange, now instead voted for union representation. Crew workers felt the farmer had broken an oral contract.

When labor management principles are properly understood, the more likely a manager will choose the right set of tools—and apply them correctly—to deal with a given challenge. Time and effort spent on improving management competence pays off. Once the foundation is laid, new skills are easier to acquire. Also, tools developed for use in one area may serve well in others. For example, a detailed job analysis may be used during the selection process. The same analysis may yield data to establish pay differences, fix performance parameters, and help tailor a training program.

An overview of human resource management is presented in Table 1-1. The list in the left column shows external constraints that are placed on the workplace, the center column lists labor management tools and practices, and the column to the right lists potential results or outcomes.

<table cut because of weird formatting issues>

I like to think of the tools in the middle column as filters or magnifiers affecting the results column. In the absence of effective human resource management practices (the middle column), external influences may have a pronounced effect on productivity and other sought after results. For instance, an employer might choose to hire the first twenty applicants who show up for a citrus-picking job without testing their skills. By so doing she forgoes the opportunity to use a selection filter to hire more productive workers.

Let’s briefly examine the elements within these three columns before moving on to the importance of purposeful action.

External influences and constraints

Tradition represents the way things have been done in the past. Some traditions ensure stability. Others may reduce creativity.

Competitors. The techniques used by competitors can influence farm practices. Like tradition, competitors may provide a positive or negative influence.

Laws at the federal, state, province, municipality, or other local level regulate almost every aspect of labor management. When well thought out, such laws can extend important protections and benefits to a large number of workers. Many laws have been passed without sufficient study, however, and the time spent in compliance can be onerous. Unfortunately, some believe that simply following the law will guarantee that they are managing properly. This book is intended for an international audience, and is focused on effective human resource management practices, more than on what is legal or not. Because laws do change frequently and are so different from one nation to another, make sure to always consult with a qualified local labor attorney before implementing the suggestions found here.

The labor market generally deals with relationships between the supply and demand of workers on the one hand and with wages on the other. Generally, a shortage of workers will drive wages up.

Technology. Labor law constraints and potentially unpredictable labor markets tend to encourage mechanization. Technology may change the nature and number of jobs but is unlikely to diminish the importance of labor.

Union contracts. Agricultural enterprise managers desire freedom to manage, while unions want to restrain possible abuses of such freedom. Furthermore, unions often fight to improve economic outcomes for employees (wages and benefits). Beside issues of economics, unions also attempt to protect worker dignity and improve working conditions. Unions may give employees a greater voice in some types of decision-making. The opposite can also be true. Perhaps the single most important predictor of unionization is the quality (or lack of) two-way communications between management and employxsees. One poor supervisor can have a negative effect on the whole organization. Other factors4 that may also play a key role on whether employees will join a union include: (1) perceived costs for joining vs. expected returns (e.g., cost of union dues vs. increases in pay), (2) personal feelings towards unionization (e.g., workers who identify with management, prefer merit over seniority, and value individual initiative are less likely to want to join a union), and (3) feelings toward a particular workplace and a particular union.

#### Increasing yield prevents food shortages and nutrient deficiencies

Tian et al 21-- Tian, Zhixi [principal investigator, Institute of Genetics and Developmental Biology and former research geneticist at Purdue], et al. "Designing future crops: challenges and strategies for sustainable agriculture." The Plant Journal 105.5 (2021): 1165-1178. (AG DebateDrills)

The first straightforward strategy for designing future crops that meet sustainable agriculture requirements is to improve the following aspects of current well-cultivated crops. Increasing yield. It is estimated that the yields of major crops need to increase at a rate of 2.4% per year to meet the food supply demand by 2050. However, the current growth rates of the four major crops, maize (Zea mays), rice (Oryza sativa), wheat (Triticum aestivum), and soybeans (Glycine max), are only approximately half of this anticipated rate (Ray et al., 2013). The development of new varieties with high yield potential that can fill this gap is the foremost mission of the Future Crops Design project. In fact, in a trial, it was reported that a super-high-yield rice variety could produce one- to threefold more grains under optimal conditions than in normal paddy fields (Liu et al., 2020a). Improving nutritional quality. Although the amount of food supply has been significantly improved in the last half-century, changes in human lifestyle and food consumption have resulted in a phenomenon called hidden hunger (Nair et al., 2016). For instance, in sub-Saharan Africa and America, about 17–30% of children under the age of 5 years have an inadequate daily intake of Vitamin A (Harjes et al., 2008; Haskell, 2012). It has been reported that about two billion people are suffering from a chronic deficiency of micronutrients (WHO, 2008), a new threat to human health. Moreover, the incidence of type-2 diabetes, obesity and colon disease has markedly increased in the past decade (Zhou et al., 2016). Hence, the second mission of the Future Crops Design project is to generate crops with higher/balanced nutritional quality or specialized metabolites using metabolic engineering and synthetic biology approaches (Francis et al., 2017; Martin and Li, 2017; Sweetlove et al., 2017; Vasconcelos et al., 2017). Increasing agricultural resource use efficiency. It was reported that ~17% of arable land has lost productivity since 1945 due to inappropriate agriculture management (Oldeman, 1994). In fact, nutrient-use efficiencies of today’s crops only reach 30–50% for nitrogen fertilizer (Cassman et al., 2002) and ~45% for phosphorus fertilizer (Smil, 2000). Moreover, fresh water has become a limiting factor for agriculture in many areas in the world. It is estimated that about 2800 km3 of fresh water per year is used for agricultural irrigation, and that crop production decreases by ~20% without irrigation (Siebert and Doll, 2010). Therefore, to reduce agricultural inputs and environmental burdens, we should aim to develop high nutrient and water-use efficiency crops without yield penalty.

#### 2 scenarios for XT:

#### 1] Food shortages cause messed up interventions that destroy biodiversity

Tian et al 21-- Tian, Zhixi [principal investigator, Institute of Genetics and Developmental Biology and former research geneticist at Purdue], et al. "Designing future crops: challenges and strategies for sustainable agriculture." The Plant Journal 105.5 (2021): 1165-1178. (AG DebateDrills)

From the perspective of human evolution, each period of rapid population growth, such as during the Neolithic agricultural revolution, which began at about 8000 BC, the hydro agricultural or irrigation revolutions in the Near East, which began about 3000 BC, and the medieval and modern agricultural periods, which began about 1000 AD, benefited from an advance in agriculture (Taiz, 2013; Wallace et al., 2018). The recent rapid population growth during the past 300 years, in contrast, mainly resulted from the Industrial Revolution, which began in Britain about 1760. The Industrial Revolution greatly increased the range of human activities and accelerated farmland expansion. In 1700, it was reported that nearly 95% of Earth’s ice-free land consisted of wildlands and semi-natural anthromes; however, by 2000, ~55% of these regions were used as arable land (Figure 1a, data from https://ourworldindata.org/). The Industrial Revolution also gave birth to new technologies and production systems in agriculture, such as the application of larger irrigation systems, and more fertilizers and pesticides. In the 1960s, semi-dwarf wheat and rice varieties were introduced. These semi-dwarf crops exhibit beneficial characteristics, such as improved response to fertilizer input, lodging resistance and enhanced light utilization (Hedden, 2003; Wallace et al., 2018). Along with the fertilizers, pesticides and irrigation systems made possible by the Industrial Revolution, semi-dwarf crops were quickly adopted and resulted in a significant increase in total grain production globally. This big leap in agriculture was known as the ‘Green Revolution’ (Khush, 2001). Indeed, statistical data have revealed that the average daily food supply per person (in terms of calories) has doubled since the middle of the 19th century (Figure 1b, data from https://ourworld indata.org/). It is estimated that the world population will rise to more than 9 billion by 2050 (Alexandratos, 1999; Cassman, 1999), and at that time we will need at least 60% more food than is consumed by humans today. Moreover, our population will continuously increase, reaching over 11 billion by 2100 (Figure 1a, data from https://ourworldindata.org/). How to feed the increasing population is a challenge facing the whole world (Tilman et al., 2001; Godfray et al., 2010; Foley et al., 2011; Wallace et al., 2018). A simple solution to feed a population of 9 billion is to constantly turn wild habitats into farmland. However, this type of expansion is unrealistic as most of the world’s icefree and non-barren land area has been exhausted, and much of the rest is unlikely to sustain high yields (Cassman, 1999). More importantly, intact forests have been known to play essential roles in protecting the environment, such as storing fresh water, decreasing flooding and regenerating fertile soils. Clearing of forests will result in prohibitive ecological costs, such as loss of biodiversity and greenhouse gas emissions. It was reported that, due to agriculture expansion, ~30% of all plant species will become extinct (Taiz, 2013). The destruction of tropical forests releases about 1.1 9 1012 tons of carbon per year, which accounts for 12% of total anthropogenic CO2 emissions (Friedlingstein et al., 2010).

#### Biodiversity loss causes extinction

**Torres 16** [Phil Biologist, conservationist, science advocate & educator. 2 years based in Amazon rainforest, now exploring science around the world. “[Biodiversity Loss: An Existential Risk Comparable to Climate Change](http://futureoflife.org/2016/05/20/biodiversity-loss/)” <http://futureoflife.org/2016/05/20/biodiversity-loss/>.]

According to the Bulletin of Atomic Scientists, the two greatest existential threats to human civilization stem from climate change and nuclear weapons. Both pose clear and present dangers to the perpetuation of our species, and the increasingly dire climate situation and nuclear arsenal modernizations in the United States and Russia were the most significant reasons why the Bulletin [decided](http://thebulletin.org/press-release/doomsday-clock-hands-remain-unchanged-despite-iran-deal-and-paris-talks9122) to keep the Doomsday Clock set at three minutes before midnight earlier this year.

But there is another existential threat that the Bulletin overlooked in its Doomsday Clock announcement: biodiversity loss. This phenomenon is often identified as one of the many consequences of climate change, and this is of course correct. But biodiversity loss is also a contributing factor behind climate change. For example, deforestation in the Amazon rainforest and elsewhere reduces the amount of carbon dioxide removed from the atmosphere by plants, a natural process that mitigates the effects of climate change. So the causal relation between climate change and biodiversity loss is bidirectional.

Furthermore, there are myriad phenomena that are driving biodiversity loss in addition to climate change. Other causes include ecosystem fragmentation, invasive species, pollution, oxygen depletion caused by fertilizers running off into ponds and streams, overfishing, human overpopulation, and overconsumption. All of these phenomena have a direct impact on the health of the biosphere, and all would conceivably persist even if the problem of climate change were somehow immediately solved.

Such considerations warrant decoupling biodiversity loss from climate change, because the former has been consistently subsumed by the latter as a mere effect. Biodiversity loss is a distinct environmental crisis with its own unique syndrome of causes, consequences, and solutions—such as restoring habitats, creating protected areas (“biodiversity parks”), and practicing sustainable agriculture.

Deforestation of the Amazon rainforest decreases natural mitigation of CO2 and destroys the habitats of many endangered species.

The sixth extinction.

The repercussions of biodiversity loss are potentially as severe as those anticipated from climate change, or even a nuclear conflict. For example, according to a 2015 [study](http://www.ncbi.nlm.nih.gov/pubmed/26601195) published in Science Advances, the best available evidence reveals “an exceptionally rapid loss of biodiversity over the last few centuries, indicating that a sixth mass extinction is already under way.” This conclusion holds, even on the most optimistic assumptions about the background rate of species losses and the current rate of vertebrate extinctions. The group classified as “vertebrates” includes mammals, birds, reptiles, fish, and all other creatures with a backbone.

The article argues that, using its conservative figures, the average loss of vertebrate species was 100 times higher in the past century relative to the background rate of extinction. (Other scientists have suggested that the current extinction rate could be as much as 10,000 times higher than normal.) As the authors write, “The evidence is incontrovertible that recent extinction rates are unprecedented in human history and highly unusual in Earth’s history.” Perhaps the term “Big Six” should enter the popular lexicon—to add the current extinction to the previous “Big Five,” the last of which wiped out the dinosaurs 66 million years ago.

But the concept of biodiversity encompasses more than just the total number of species on the planet. It also refers to the size of different populations of species. With respect to this phenomenon, multiple studies have confirmed that wild populations around the world are dwindling and disappearing at an alarming rate. For example, the 2010 [Global Biodiversity Outlook](https://www.cbd.int/gbo3) report found that the population of wild vertebrates living in the tropics dropped by 59 percent between 1970 and 2006.

The report also found that the population of farmland birds in Europe has dropped by 50 percent since 1980; bird populations in the grasslands of North America declined by almost 40 percent between 1968 and 2003; and the population of birds in North American arid lands has fallen by almost 30 percent since the 1960s. Similarly, 42 percent of all amphibian species (a type of vertebrate that is sometimes called an “ecological indicator”) are undergoing population declines, and 23 percent of all plant species “are estimated to be threatened with extinction.” [Other studies](http://commondreams.org/views/2016/02/10/biodiversity-loss-and-doomsday-clock-invisible-disaster-almost-no-one-talking-about) have found that some 20 percent of all reptile species, 48 percent of the world’s primates, and 50 percent of freshwater turtles are threatened. Underwater, about 10 percent of all coral reefs are now dead, and another 60 percent are in danger of dying.

Consistent with these data, the 2014 [Living Planet Report](http://bit.ly/1ssxx5m) shows that the global population of wild vertebrates dropped by 52 percent in only four decades—from 1970 to 2010. While biologists often avoid projecting historical trends into the future because of the complexity of ecological systems, it’s tempting to extrapolate this figure to, say, the year 2050, which is four decades from 2010. As it happens, a 2006[study](http://science.sciencemag.org/content/314/5800/787) published in Science does precisely this: It projects past trends of marine biodiversity loss into the 21st century, concluding that, unless significant changes are made to patterns of human activity, there will be virtually no more wild-caught seafood by 2048.

48% of the world’s primates are threatened with extinction.

Catastrophic consequences for civilization.

The consequences of this rapid pruning of the evolutionary tree of life extend beyond the obvious. There could be surprising effects of biodiversity loss that scientists are unable to fully anticipate in advance. For example, prior research has shown that localized ecosystems can undergo abrupt and irreversible shifts when they reach a tipping point. According to a 2012 [paper](http://www.nature.com/nature/journal/v486/n7401/full/nature11018.html) published in Nature, there are reasons for thinking that we may be approaching a tipping point of this sort in the global ecosystem, beyond which the consequences could be catastrophic for civilization.

As the authors write, a planetary-scale transition could precipitate “substantial losses of ecosystem services required to sustain the human population.” An ecosystem service is any ecological process that benefits humanity, such as food production and crop pollination. If the global ecosystem were to cross a tipping point and substantial ecosystem services were lost, the results could be “widespread social unrest, economic instability, and loss of human life.” According to Missouri Botanical Garden ecologist Adam Smith, one of the paper’s co-authors, this could occur in a matter of decades—far more quickly than most of the expected consequences of climate change, yet equally destructive.

Biodiversity loss is a “threat multiplier” that, by pushing societies to the brink of collapse, will exacerbate existing conflicts and introduce entirely new struggles between state and non-state actors. Indeed, it could even fuel the rise of terrorism. (After all, climate change has been [linked](http://thebulletin.org/climate-change-and-syrian-uprising) to the emergence of ISIS in Syria, and multiple high-ranking US officials, such as former US Defense Secretary [Chuck Hagel](http://www.defense.gov/News-Article-View/Article/603441)and CIA director [John Brennan](http://www.cnsnews.com/news/article/cnsnewscom-staff/cia-director-cites-impact-climate-change-deeper-cause-global), have affirmed that climate change and terrorism are connected.)

The reality is that we are entering the sixth mass extinction in the 3.8-billion-year history of life on Earth, and the impact of this event could be felt by civilization “in as little as three human lifetimes,” as the aforementioned 2012 Nature paper notes. Furthermore, the widespread decline of biological populations could plausibly initiate a dramatic transformation of the global ecosystem on an even faster timescale: perhaps a single human lifetime.

The unavoidable conclusion is that biodiversity loss constitutes an existential threat in its own right. As such, it ought to be considered alongside climate change and nuclear weapons as one of the most significant contemporary risks to human prosperity and survival.

#### 2] U.S. agricultural collapse and food insecurity trigger great power wars—multiple hotspots.

Castellaw 17 (John – 36-year veteran of the U.S. Marine Corps and the Founder and CEO of Farmspace Systems LLC, “Opinion: Food Security Strategy Is Essential to Our National Security,” 5/1/17, <https://www.agri-pulse.com/articles/9203-opinion-food-security-strategy-is-essential-to-our-national-security>)

The United States faces many threats to our National Security. These threats include continuing wars with extremist elements such as ISIS and potential wars with rogue state North Korea or regional nuclear power Iran. The heated economic and diplomatic competition with Russia and a surging China could spiral out of control. Concurrently, we face threats to our future security posed by growing civil strife, famine, and refugee and migration challenges which create incubators for extremist and anti-American government factions. Our response cannot be one dimensional but instead must be a nuanced and comprehensive National Security Strategy combining all elements of National Power including a Food Security Strategy. An American Food Security Strategy is an imperative factor in reducing the multiple threats impacting our National wellbeing. Recent history has shown that reliable food supplies and stable prices produce more stable and secure countries. Conversely, food insecurity, particularly in poorer countries, can lead to instability, unrest, and violence. Food insecurity drives mass migration around the world from the Middle East, to Africa, to Southeast Asia, destabilizing neighboring populations, generating conflicts, and threatening our own security by disrupting our economic, military, and diplomatic relationships. Food system shocks from extreme food-price volatility can be correlated with protests and riots. Food price related protests toppled governments in Haiti and Madagascar in 2007 and 2008. In 2010 and in 2011, food prices and grievances related to food policy were one of the major drivers of the Arab Spring uprisings. Repeatedly, history has taught us that a strong agricultural sector is an unquestionable requirement for inclusive and sustainable growth, broad-based development progress, and long-term stability. The impact can be remarkable and far reaching. Rising income, in addition to reducing the opportunities for an upsurge in extremism, leads to changes in diet, producing demand for more diverse and nutritious foods provided, in many cases, from American farmers and ranchers. Emerging markets currently purchase 20 percent of U.S. agriculture exports and that figure is expected to grow as populations boom. Moving early to ensure stability in strategically significant regions requires long term planning and a disciplined, thoughtful strategy. To combat current threats and work to prevent future ones, our national leadership must employ the entire spectrum of our power including diplomatic, economic, and cultural elements. The best means to prevent future chaos and the resulting instability is positive engagement addressing the causes of instability before it occurs. This is not rocket science. We know where the instability is most likely to occur. The world population will grow by 2.5 billion people by 2050. Unfortunately, this massive population boom is projected to occur primarily in the most fragile and food insecure countries. This alarming math is not just about total numbers. Projections show that the greatest increase is in the age groups most vulnerable to extremism. There are currently 200 million people in Africa between the ages of 15 and 24, with that number expected to double in the next 30 years. Already, 60% of the unemployed in Africa are young people. Too often these situations deteriorate into shooting wars requiring the deployment of our military forces. We should be continually mindful that the price we pay for committing military forces is measured in our most precious national resource, the blood of those who serve. For those who live in rural America, this has a disproportionate impact. Fully 40% of those who serve in our military come from the farms, ranches, and non-urban communities that make up only 16% of our population. Actions taken now to increase agricultural sector jobs can provide economic opportunity and stability for those unemployed youths while helping to feed people. A recent report by the Chicago Council on Global Affairs identifies agriculture development as the core essential for providing greater food security, economic growth, and population well-being. Our active support for food security, including agriculture development, has helped stabilize key regions over the past 60 years. A robust food security strategy, as a part of our overall security strategy, can mitigate the growth of terrorism, build important relationships, and support continued American economic and agricultural prosperity while materially contributing to our Nation’s and the world’s security.

**Extinction**

**Cribb 19** [Julian Cribb is a distinguished science writer with more than thirty awards for journalism. He was a newspaper editor, founder of the influential ScienceAlert website and author of eight books, including The Coming Famine. Food as Existential Risk. August, 2019. https://www.cambridge.org/core/books/food-or-war/food-as-an-existential-risk/8C45279588CD572FE805B7E240DE7368]

As things stand, the only entities that can afford to own nuclear weapons are nations - and if **humanity** is to be **wiped out**, it will most likely be as a **result** of an **atomic conflict** between nations. It follows from this that, if the world is to be made safe from such a fate it will need to get rid of nations as a structure of human self-organisation and replace them with wiser, less aggressive forms of self-governance. After all, the nation state really only began in the early nineteenth century and is by no means a permanent feature of self-governance, any more than monarchies, feudal systems or priest states. Although many people still tend to assume it is. Between them, nations have butchered more than 200 million people in the past 150 years and it is increasingly clear the world would be a far safer, more peaceable place without either nations or nationalism. The question is what to replace them with.

Although **there may** at first glance **appear** to be **no close linkage** between **w**eapons of **m**ass **d**estruction and **food**, in the twentyfirst century with world resources of **food**, land and water under **growing stress**, **nothing can be ruled out**. Indeed, chemical weapons have frequently been deployed in the Syrian civil war, which had drought, agricultural failure and hunger among its early drivers. And **nuclear conflict** remains a **distinct possibility** in **South Asia** and the **Middle East**, especially, as these regions are already **stressed in** terms of **food**, land and water, and their **nuclear firepower** or access to nuclear materials is **multiplying**.

It remains an open question whether **panicking regimes** in **Russia**, the **USA** or even **France** would be **ruthless enough** to deploy **atomic weapons** in an attempt to **quell invasion** by tens of millions of **desperate refugees**, **fleeing famine** and climate chaos in their own homelands - but the possibility ought not to be ignored.

That **nuclear war** is at least a possible outcome of **food** and climate **crises** was first flagged in the report The Age of Consequences by Kurt Campbell and the US-based Centre for Strategic and International Studies, which stated ‘it is clear that even nuclear war cannot be excluded as a political consequence of global warming’.15 **Food insecurity** is therefore a **driver** in the **preconditions** for the **use of nuclear weapons**, whether limited or unlimite**d.**

### Framework

***Only* pleasure and pain are intrinsically valuable – all others exist in relation**

**Moen 16** [Ole Martin Moen, Research Fellow in Philosophy at University of Oslo “An Argument for Hedonism” Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281] SJDI

Let us start by observing, empirically, that **a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable.** **On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues.** This inclusion makes intuitive sense, moreover, for **there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have.** “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative.2 **The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values.** If you tell me that you are heading for the convenience store, **I might ask: “What for?” This is a reasonable question, for when you go to the convenience store you usually do so**, not merely for the sake of going to the convenience store, but **for the sake of achieving something further that you deem to be valuable.** You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” **If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.**3 As Aristotle observes**: “We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.**”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that if something is painful, we have a sufficient explanation of why it is bad. If we are onto something in our everyday reasoning about values, it seems that **pleasure and pain are both places where we reach the end of the line in matters of value.**

#### Thus, the standard is maximizing expected wellbeing.