RECONCEIVING PUBLIC-PRIVATE PARTNERSHIPS TO ERADICATE HUNGER: RECOGNIZING SMALL-SCALE FARMERS AND AGRICULTURAL BIOLOGICAL DIVERSITY AS THE FOUNDATION OF GLOBAL FOOD SECURITY

Susan H. Bragdon*, and Carly Hayes**

Abstract

Public-private partnerships (PPPs) have a long history in development rhetoric yet in general have not fulfilled the promises they have made in the form of increased economic gains (except for industry actors themselves), efficiency, and improved provision of traditionally "public goods." Noting that food, biological diversity, and small-scale farmers are intersectional areas critical to ending hunger and malnutrition and creating resilient food systems, this Paper examines the history and potential future of PPPs in agricultural development. To be effective going forward, the Paper concludes that PPPs must distinguish corporate agribusiness from small-scale farmers as private actors. The focus of PPPs must shift to the strengthening of partnerships between the public sector and small-scale farmers as private actors in recognition that small-scale farmers are essential partners representing the private sector "P" in PPPs for agricultural development. The Paper frames the relationship between trade liberalization and agricultural production from the perspective of biodiversity, diet, and nutrition, discusses the risks of product specialization for small-scale farmers, and provides a new perspective for the analysis of the role of PPPs in financing development. The Paper concludes that if PPPs are to achieve gains in addressing hunger and malnutrition, four dominant assumptions will need to be critiqued and reframed: (1) increasing production is the core issue, (2) the private sector and markets must be allowed to operate freely, (3) technological solutions are required, and (4) innovative financing mechanisms are needed.

---

* J.D. University of Michigan 1987, MSc University of Michigan, from the School of Natural Resources in Resource Ecology.

** University of Waterloo.

I. INTRODUCTION: SUSTAINABLE DEVELOPMENT GOALS, PUBLIC-PRIVATE PARTNERSHIPS, AND ZERO HUNGER[1]

In September 2015, the United Nations General Assembly adopted Agenda 2030 for Sustainable Development (Agenda 2030), with its Preamble stating its determination "to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path."[2]

One challenge is achieving Sustainable Development Goal (SDG) 2, which is to "*[e]nd hunger, achieve food security and improved nutrition[,] and promote sustainable agriculture*" by 2030.[3] As this goal recognizes, the number of people who are hungry and/or malnourished—including over- and under-nutrition and micronutrient deficiencies—remains unacceptably high, and the number of people struggling with obesity

1. Each SDG has an abbreviated version of its longer title. SDG 2 *End Hunger, achieve food security and improved nutrition and promote sustainable agriculture* is Zero Hunger. U.N., *Goal 2*, https://unstats.un.org/sdgs/report/2016/goal-02/ (last visited Oct. 1, 2018).

2. *Transforming our world: the 2030 Agenda for Sustainable Development*, U.N., https://sustainabledevelopment.un.org/post2015/transformingourworld (last visited Aug. 10, 2017).

3. *Sustainable Development Goal 2*, U.N., https://sustainabledevelopment.un.org/sdg2 (last visited Aug. 10, 2017).

and diet-related disease is growing and spreading globally. In addition, twenty million people are experiencing, or on the brink of experiencing, famine—the greatest number since World War II.[4]

While a food system is the growing, harvesting, processing, packaging, transporting, marketing, consuming, and disposing of food,[5] this Paper will focus on where it all begins: with agricultural production. Specifically, the focus will be on what role public-private partnerships (PPPs) might play in supporting two foundational aspects of agricultural production:

1) Small-scale farmers: the 1.5 billion small-scale farmers producing 70% of the food consumed on the planet today, and in some areas up to 90 to 100%, because they are, and need to continue to be, the backbone of global agricultural production; and
2) Agricultural diversity: agrobiodiverse systems[6] and agricultural biodiversity because these systems and resources are the key to the health and nutrition of people, as well as the resilience and health of our planet.

Both small-scale farmers and agricultural biodiversity are critical to the achievement of key elements of most of the SDGs.[7] In addition to being essential for the resilience and stability of agricultural production systems and the ability to adapt to climate change and other stressors, agricultural biodiversity is fundamental to the livelihoods, health, and nutrition of billions of people (see Box 1).

Before evaluating PPPs in the context of the SDGs and food and agricultural systems, it is important to take note of critical features and trends that may influence the shape of PPPs:

4. South Sudan is currently experiencing famine. Nigeria, Somalia and Yemen are considered on the brink. Max Bearak & Laris Karklis, *Starving to Death*, WASH. POST (Apr. 11, 2017), https://www.washingtonpost.com/graphics/world/2017-famines/?utm_term=.dac9b3f1971c.

5. Myriam Welvaert, *The Future Food System: The World on One Plate?*, FAO (Oct. 20, 2016, 05:30 AM), http://www.fao.org/cfs/home/blog/blog-articles/article/en/c/448182/.

6. Thus, agrobiodiversity and agrobiodiverse systems encompass the variety and variability of animals, plants, and micro-organisms that are necessary for sustaining key functions of the agroecosystem, including its structure and processes for, and in support of, food production and food security. *What is Agrobiodiversity?*, FAO, www.fao.org/3/a-y5609e.pdf (last visited Oct. 1, 2018).

7. Susan Bragdon, *Living Links Connecting the Sustainable Development Goals: Small-scale farmers and agricultural biodiversity* (forthcoming 2018).

- Food is a commodity but is also so much more than a commodity; it is a human right.[8] The duality makes discussions around how to achieve public interest goals tricky when there are differing views on the reach or limitations of the market.
- Small-scale farmers are a critical part of the private sector in agriculture. They are also major investors in agricultural production, even if only in labor.
- Multinational firms dominate agricultural markets, and corporate concentration is growing. The interest of large corporations has a powerful influence on national and international policy-making. Governments and international agencies are under pressure to promote market-friendly policies and, with reduced resources, may be unable to provide goods and services in the public interest or at least to provide a strong counterbalance.[9]
- The growing strength and concentration of agribusiness has been paralleled by a gradual dismantling of the public sector as both a regulator and a provider of goods and services.

There is cause for great hope in the call for PPPs as an implementation mechanism for achieving the SDGs in the context of hunger, health, nutrition, and planetary resilience. But it all depends on how the "P" in private is defined, the strength of the "P" in public, and how meaningful the "P" of partnership will ultimately be.

This Paper argues that PPPs in agricultural production need to be structured in an entirely different way than is traditionally conceived between agribusiness and government. For the partnership to be meaningful in the context of the SDGs, the public sector must be strengthened so that it can effectively support small-scale farmers, as well as the on-farm maintenance and development of agricultural biodiversity. Farming is mainly a private activity implemented locally in most parts of the world by small-scale farmers. Yet their innovative activities, including the ongoing development of agricultural biodiversity, is in the public interest. The "P" for private must therefore be the small-scale farmer working with agricultural biodiversity. In the context of the SDGs, this

8. International Covenant on Economic, Social and Cultural Rights, adopted Dec. 16, 1966, 993 U.N.T.S. 3 (entered into force Jan. 3, 1976); Universal Declaration of Human Rights, G.A. Res. 217A (III), U.N. Doc. A/810 at 71 (1948).

9. *Corporate Concentration*, ETC GROUP, http://www.etcgroup.org/content/corporate-concentration (last visited Sept. 3, 2017).

keeps food, nutrition, and the health of people and the planet inseparable.

For purposes of this Paper, we will therefore use the term "industry" rather than "private sector" to distinguish large corporations and agribusiness from private sector actors such as small-scale farmers.

The next section of this Paper surveys the state of food and nutrition security, as well as its connections to health and dietary diversity, before turning to trends related to globalization and trade liberalization affecting food security. Part III then describes the characteristics of the modern industrial food systems that emerged after World War II and feed 30% of humanity; it then describes the system led by 1.5 billion small-scale farmers who feed upwards of 70% of humanity. Part IV examines PPPs in the context of the SDGs generally before turning to the context of agricultural biodiversity and small-scale farmers in particular. Part V concludes with an analysis of the assumptions that must be overcome for the bold transformational change through PPPs to occur in efforts to achieve SDG 2.

II. Food, Nutrition, Health, and Dietary Diversity: Connections and Trends

A. *Global Hunger and Nutrition-Related Health Issues*

One in nine people—or about 795 million globally—go to sleep on an empty stomach each night. [10] Hidden hunger, also known as micronutrient deficiencies, afflicts more than two billion individuals, or around one in three people, globally.[11] The 2017 State of Food and Nutrition Security in the World Report alerted the world that 2016 saw the first increase in the number of hungry people in a decade.[12] The vast majority of the world's hungry live in developing countries.[13] According to the 2016 Global Hunger Index (GHI), levels of hunger are serious or alarming in fifty countries.[14] The highest hunger levels are still found in Africa south of the Sahara and South Asia. Although

10. *Zero Hunger*, World Food Program, http://www.wfp.org/hunger/who-are (last visited Oct. 15, 2018).

11. Klaus von Grebmer, et al., Int'l Food Policy Research Inst., 2014 Global Hunger Index: The Challenge of Hidden Hunger (Andrea Sonntag et al. eds., 2014).

12. FAO, IFAD, UNICEF, WFP, & WHO, The State of Food Security and Nutrition in the World 2017, http://www.fao.org/3/a-I7695e.pdf (last visited Sept. 22, 2017).

13. *Zero Hunger*, World Food Programme, https://www1.wfp.org/zero-hunger (last visited Jan. 17, 2019).

14. K. von Grebmer et al., 2016 Global Hunger Index: Getting to Zero Hunger 5 (Andrea Sonntag et al. eds., 2016).

GHI scores for these two regions have declined over time, the current levels remain close to the alarming category. In the last few years, the world passed another milestone: for the first time the number of people struggling with obesity surpassed those struggling with hunger and micronutrient deficiency.[15] Today, at least two billion people consume excess calories, many of whom also do not get enough nutrients.[16] Malnutrition is often taken to mean too little nutrition; but really, it means poor nutrition.[17]

Underpinning both overconsumption and undernutrition is dietary simplification. Modern high-input, high-yield agriculture and long-distance transport has increased the availability and affordability of refined carbohydrates (wheat, rice, and sugar) and edible oils,[18] resulting in a slight decrease in the percentage of people who do not get sufficient calories and the amount of variation in the average diet. And it is dietary simplification that underlies the fact that for the first time in history, the global burden of disease is now primarily diet-related obesity, diabetes, heart disease, cancer, and other non-communicable diseases.[19] Our modern system has contributed to the erosion of dietary diversity, nutrient deficiencies, and increasing rates of associated chronic diseases.

Global burden of disease means that the diseases noted above are no longer only problems limited to high-income countries; in fact, they are growing fastest in low- and middle-income countries, where 80% of the deaths from these diseases now occur.[20] These diseases account for 70% of all adult deaths in the Western Pacific Region, and the Food Summit held in Vanuatu in April 2010 cited "declines in traditional food crops, increased dependence on imported foods and growing vulnerability to climate change" as among the most important reasons.[21]

---

15. INT'L FED'N OF RED CROSS & RED CRESCENT SOC'Y, WORLD DISASTERS REPORT 2011: FOCUS ON HUNGER AND MALNUTRITION 251 (2011).

16. The GBD 2015 Obesity Collaborators, *Health Effects of Overweight and Obesity in 195 Countries over 25 Years*, 377 NEW ENG. J. MED. 13 (June 17, 2017), https://www.nejm.org/doi/full/10.1056/NEJMoa1614362.

17. Marie Ng et al., *Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013*, 384 LANCET 766 (Aug. 30, 2014), http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(14)60460-8.pdf.

18. WHO, GLOBALIZATION, DIETS AND NONCOMMUNICABLE DISEASE (2002).

19. Stephen S. Lims et al., *A Comparative Risk Assessment of Burden of Disease and Injury Attributable to 67 Risk Factors and Risk Factor Clusters in 21 Regions*, 380 LANCET 2224, 2224-60 (2012).

20. The GBD 2015 Obesity Collaborators, *supra* note 16.

21. Emile Frison, *Agricultural Biodiversity for Health and Nutrition*, SCI. ALERT (Nov. 30, 2010), https://www.sciencealert.com/agricultural-biodiversity-for-nutrition-and-health.

Africa and Asia bear 94% of the global stunting burden, *as well as* 73% of the burden of overweight children under five years old.[22] This "dual burden" of undernutrition and obesity exists not only in countries and communities, but in households as well.[23]

Dietary diversity is one guarantee of an adequate supply of essential micronutrients. Without diversity in their diet, people can have enough to eat and yet still suffer the hidden hunger of malnutrition. Diversity of diet, founded on diverse farming systems, delivers better nutrition and greater health with additional benefits for human productivity and livelihoods. Moreover, it has the added value of being essential to cope with the predicted impact of climate change.[24]

The erosion of agricultural biodiversity is occurring as traditional production systems and the cultivation of diverse landrace varieties are replaced with more modern industrialized production systems and the cultivation of uniform, high-yielding varieties,[25] a trend which has been referred to the "homogenization" of the global food supply.[26] Today, twelve plant crops and fourteen animal species provide 98% of world's food needs with wheat, rice, and maize alone accounting for more than 50% of the global energy intake.[27] Uniformity of production and wider biodiversity destruction has led to the loss of many wild relatives of crop plants and livestock.[28]

B. *The Impact of Globalization and Trade Liberalization on Food Security*

The increasing global reach of obesity and other diet-related diseases, as well as the pressures on farmers in traditional production systems, are deeply rooted in the processes of globalization. Specifically:

---

22. UNICEF, WHO, & WBG, LEVELS AND TRENDS IN CHILD MALNUTRITION (2017), https://data.unicef.org/wp-content/uploads/2017/06/JME-2017_brochure_June-25.pdf.

23. Barry M. Popkin et al., *Now and Then: The Global Nutrition Transition: The Pandemic of Obesity in Developing Countries*, 70 NUTR. REV. 3, 9 (2012).

24. Frison, *supra* note 21.

25. Comm'n on Genetic Resources for Food and Agriculture, Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture, at 15 (2010).

26. José Esquinas-Alcázar, *Protecting Crop Genetic Diversity for Food Security: Political, Ethical, and Technical Challenges*, 6 NATURE 946 (2005).

27. Paul R. Ehrlich & Edward O. Wilson, *Biodiversity Studies: Science and Policy*, 253 SCIENCE 758 (1991); Lori A. Thrupp, *Linking Agricultural Biodiversity and Food Security: The Valuable Role of Agrobiodiversity for Sustainable Agriculture*, 76 INT'L AFF. 265 (2000).

28. JOHN TUXILL, TROPICAL FOREST NETWORK, BENEFITS OF BIODIVERSITY: APPRECIATING THE BENEFITS OF PLANT BIODIVERSITY (1999), http://www.tropicalforestnetwork.com/biodiversity.html; Secretariat of the Convention on Biological Diversity, Biodiversity Indicators and the 2010 Target: Experiences and Lessons Learnt from the 2010 Biodiversity Indicators Partnership, 53 CBD Technical Series (2010).

> Globalization is having a major impact on food systems around the world . . . [which] affect availability and access to food through changes to food production, procurement and distribution . . . in turn bringing about a gradual shift in food culture, with consequent changes in dietary consumption patterns and nutritional status that vary with the socio-economic strata.[29]

The recognition of the differential effect depending on socioeconomic strata goes to the heart of discussions around globalization: that it disproportionately benefits people who are already advantaged both within and between countries. Thus, trade rules and subsidies may provide access to cheaper, less nutritious food for poorer people, as well as expensive off-season fruits and vegetables for those with the resources to access and purchase them.[30] For purposes of this section, we will focus on what we can discern about the forces of globalization and the impact on small-scale farmers, agricultural biodiversity, and dietary trends among the poor, noting that small-scale farmers are often poor and food-insecure themselves.[31]

Trade liberalization is premised on producing what is in a country's comparative advantage to produce and trading for what is not. Beginning with structural adjustment programs followed by trade and investment rules, developing countries throughout the 1980s and 1990s put this premise into practice, weakening both domestic food production capacity and diversified agricultural systems. The approach led countries to rely on international trade to meet domestic food needs, resulting in rising import dependence and declining local production; a bias towards cash crops for export over food production for domestic markets; and support for high-input agricultural methods over diversified and more environmentally sustainable low-input systems.[32] Furthermore, this theory of comparative advantage says nothing about nutrition and dietary diversity as a key component of food

29. Gina Kennedy et al., *Globalization of Food Systems in Developing Countries: A Synthesis of Country Case Studies*, FAO (2004), http://www.fao.org/3/a-y5736e.pdf.

30. Colin K. Khoury et al., *Increasing homogeneity in global food supplies and the implications for food security*, 111 PROC. NAT'L ACAD. SCI. 4001 (2014).

31. TUXILL, *supra* note 29.

32. The bulk of industrially-produced grain crops goes to biofuels and confined animal feedlots rather than to food for the world's one billion hungry people. The need to double food production only applies if the priority is feeding the growing population of livestock and cars rather than hungry people.

security; rather, it equates production and sufficient calories with food security.[33]

With the theory of comparative advantage, trade liberalization tends to support greater production specialization. Once a country specializes in its production of goods, it has little choice but to trade, because adjustment back to a more diverse economy is difficult and time-consuming.[34] This is particularly problematic with small-scale farming, where loss of diversity and knowledge can be irreversible. The challenge is insurmountable if the switch has been made from diverse food crops to non-edibles such as coffee or horticultural products. Even if the seeds, knowledge, and fertile land were still available, it takes a season to produce a crop. In the meantime, a net importing country, particularly a developing country, will be vulnerable to price spikes or shortages due to unforeseen weather events or pests and diseases.

This was demonstrated in the food crisis of 2007 to 2008, when world food prices increased dramatically and caused social unrest in both developed and developing countries. Beginning in the 1970s and 1980s with the policies of structural adjustment and later trade liberalization, developing countries began to shift from being food independent to being net food importing economies.[35] Without improvement in local agriculture, many countries became completely dependent upon food imports.[36] During the summer of 2007, twenty-nine countries cut back on food exports to ensure their populations had enough to eat.[37] Several countries in South Asia have limited or banned exports of rice.[38] In other countries, exports of wheat and even sunflower seeds have been restricted.[39] The peril of relying on the theory of

33. Jennifer Clapp, *Trade Liberalization and Food Security: Examining the Linkages*, QUAKER U.N. ORG. (June 2014), http://quno.org/sites/default/files/resources/QUNO_Food%20Security_Clapp.pdf.

34. Herman E. Daly, *The Perils of Free Tra*de, 269 SCI. AM. 50, 50-57 (1993).

35. Susan H. Bragdon, Reinvigorating the Public Sector: The Case of Food Security, Small-scale Farmers, Trade and Intellectual Property Rules, 59 PALGRAVE MACMILLAN & SOC'Y FOR INT'L DEV. 280 (2016).

36. MARTIN KHOR, THE IMPACT OF TRADE LIBERALIZATION ON AGRICULTURE IN DEVELOPING COUNTRIES: THE EXPERIENCE OF GHANA (Third World Network 2008); JENNIFER CLAPP, HUNGER IN THE BALANCE: THE NEW POLITICS OF INTERNATIONAL FOOD AID (Cornell Univ. Press 2012).

37. Keith Bradsher & Andrew Martin, *Food Crisis Deepens as Countries Restrict Export*, N.Y. TIMES (June 30, 2008), at https://www.nytimes.com/2008/06/30/business/worldbusiness/30iht-trade.4.14106348.html. David.

38. David Montero, *Asia Limits Rice Exports and as Prices and Uncertainty Rise*, CHRISTIAN SCI. MONITOR (Apr. 22, 2008), at https://www.csmonitor.com/World/Asia-Pacific/2008/0422/p12s01-woap.html.

39. Mark Hughes, *Global Food Crisis*, INFOPLEASE (Aug. 20, 2017), https://www.infoplease.com/science-health/environment/global-food-crisis.

comparative advantage—that a country could trade for the food it needed—was revealed. The effects of the social unrest and millions who fell into poverty have proved to have lasting effects up until today, including more dangerous work and less nutritious diets.[40]

The World Trade Organization's Agreement on Agriculture (AoA) and current multilateral negotiations do not support small-scale food production as a means of feeding the world sustainably.[41] Bilateral, regional, and, more recently, "mega-regional" free trade agreements are being negotiated among countries with large disparities in economic development.[42] For example, both the AoA and the North American Free Trade Agreement (NAFTA), signed in 1993, opened up domestic markets to products from countries with heavily-subsidised agricultural sectors.[43] Because of their artificially low prices, these products undercut the ability of domestic producers to compete in their own markets. Under NAFTA, this resulted in the unemployment of an estimated two million Mexican maize farmers and the replacement of diverse farming systems with processed foods.[44] NAFTA triggered an immediate surge of direct investment from the United States into Mexico's food processing industry.[45] Between 1999 and 2004, three-quarters of the country's

40. PATTA SCOTT-VILLIERS ET AL., PRECARIOUS LIVES: FOOD, WORK AND CARE AFTER THE GLOBAL FOOD CRISIS (Inst. of Dev. Stud. and Oxfam Int'l 2016).

41. OLIVIER DE SCHUTTER, INTERNATIONAL TRADE IN AGRICULTURE AND THE RIGHT TO FOOD, 21, 35 (Friedrich-Ebert-Stiftung Occasional Paper No. 46, November 2019), https://library.fes.de/pdf-files/bueros/genf/06819.pdf ("Trade liberalization contributes to reshaping the global food supply chain in a way which favors transnational corporations, whose freedom to act is broadened at the same moment as the regulatory tools States may resort to are being limited. But the economic impacts are not all that matters. International trade in agricultural commodities also has profound impacts on the environment, and on nutrition and health, which States cannot ignore"; "It is noteworthy however that the emphasis put on the production of cash crops for exports, a result of greater opportunities created by international trade, encourages the development of homogenization in agriculture, and a substitution of monocropping to polycropping").

42. PETER DRAPER ET AL., MEGA-REGIONAL FREE TRADE AGREEMENTS: IMPLICATIONS FOR THE AFRICAN, CARIBBEAN AND PACIFIC COUNTRIES (ECIPE Occasional Paper No. 2, 2014).

43. C.G. Gonzalez, *Institutionalising Inequality: The WTO Agreement on Agriculture, Food Security and Developing Countries*, 27 COLUM. J. ENV'T L. 440 (2002); TIMOTHY A. WISE & SOPHIA MURPHY, GLOB. DEV. & ENV'T INST. & INST. FOR AGRIC. & TRADE POLICY, RESOLVING THE FOOD CRISIS: ASSESSING GLOBAL POLICY REFORMS SINCE 2007 (2012), http://www.ase.tufts.edu/gdae/Pubs/rp/ResolvingFoodCrisis.pdf.

44. A.P. Thirlwall, *The Rhetoric and Reality of Trade Liberalization in Developing Countries*, 3 RIVISTA ITALIANA DEGLI ECONOMISTI 3 (2014).

45. Ramon Vera Herrera, *The Global South has Free Trade to Thank for its Obesity and Diabetes Epidemic*, GUARDIAN (Aug. 20, 2017), https://www.theguardian.com/commentisfree/2015/apr/06/global-south-has-free-trade-to-thank-obesity-diabetes-epidemic.

foreign investment went into the production of processed foods, sales of which went up by 5-10% per year. After visiting Mexico in 2012, Olivier de Shutter, the U.N. Special Rapporteur on the Right to Food, reported that "[t]he overweight and obesity emergency that Mexico is facing could have been avoided, or largely mitigated, if the health concerns linked to shifting diets had been integrated into the design of the country's trade policies."[46]

III. The Modern Industrial Food System and the Real Food System

The modern industrial food system that emerged after World War II has, in many ways, radically altered the way food is produced, processed, packaged, distributed, sold, and consumed in many, and increasing, parts of the world. This Paper focuses on the first stop in a food system: agricultural production. Industrial agriculture is an intensive, high-input, linear system focusing on increasing production and yields without regard for the environmental, social, or health costs. The focus on production and yields leads to a focus on a smaller number of crops, decreasing not only dietary diversity but the nutritional value of the diminished number of crops grown.[47]

Furthermore, the environmental impact of these agricultural methods in the long run produces a greater cost than can possibly be sustained over time. Industrial agriculture is the single greatest user of freshwater resources on the planet and the greatest driver of biodiversity loss.[48] Given its dependence on fossil fuels and agrochemicals, agriculture is well known as one of the greatest contributors to climate and land-use change.[49] Despite the arguments put forth by proponents of the Green Revolution and high-input agriculture,[50] it is unclear to what extent these methods prevented greater land from coming into production. Some argue that 20% of the yield increases that arose from

46. Olivier de Schutter (Special Rapporteur on the Right to Food), *Mission to Mexico*, U.N. Doc. A/HRC/19/59/add.2 (Jan. 17, 2012), http://www2.ohchr.org/english/bodies/hrcouncil/docs/19session/A-HRC-19-59-Add2_en.pdf.

47. Donald R Davis et al., *Changes in USDA Food Composition Data for 43 Garden Crops, 1950 to 1999*, 23 J. Am. Coll. Nutr. 669 (2013).

48. The ETC Grp., Who Will Feed Us? The Peasant Food Web vs. The Industrial Food Chain 35 (3rd ed. 2017), http://www.etcgroup.org/sites/www.etcgroup.org/files/files/etc-whowillfeedus-english-webshare.pdf; Jonathan A. Foley et al., *Solutions for a Cultivated Planet*, 478 Nature 337 (2011).

49. Foley et al., *supra* note 46, at 337-42 (2011).

50. *See, e.g.*, Robert Paarlberg, *In Need of a Green Revolution*, Harv. Int'l Rev. (June 9, 2008), http://hir.harvard.edu/article/?a=1723.

the Green Revolution were achieved through direct land conversion.[51] Other research indicates that seventeen to twenty-seven million hectares may have been spared, a net effect much smaller than proposed.[52] Numerous problems underpin industrial agriculture's ability to be truly sustainable in the long run, as synthetic pesticides and the use of monocultures remove soil-enriching nutrients and cause erosion to occur at a much faster rate. Water supplies are also being depleted, and antibiotics used in livestock impact the safety of the water supply and the food that is consumed.

In addition, the modern industrial system undermines the food and nutrition security and the biological resources upon which it ultimately depends.[53] The loss of on-farm diversity depletes the very resources that are the foundation of the ability to adapt to global environmental change. Moreover, the abandonment of diverse farm management practices associated with the arrival of industrial agriculture erodes small-scale farmers' capacity to innovate in response to environmental and socio-economic changes.[54]

The industrial food system is also a top-down, linear system. It identifies constraints, usually input constraints, and addresses them individually. Poor soil? Add fertilizer. Pests? Add pesticide. Too little water? Subsidize the building of a big dam.[55] It is this disaggregation that has enabled industrial agriculture to become untethered from planetary boundaries, as well as become a major contributor to climate change, the largest user of fresh water resources, the biggest driver of biodiversity loss, and a polluter causing dead zones in our oceans.[56] It represents a shift away from individual and community control to corporate control of land, water, and seeds, rooted in forces of globalization.

---

51. T.C.H. Sunderland, *Food Security: Why is Biodiversity Important*, 13 INT'L FORESTRY REV. 265, 265-74 (2011).

52. James R. Stevenson et al., *Green Revolution Research Saved an Estimated 18 to 27 Million Hectares from Being Brought into Agricultural Production*, 110 PROC. NAT'L ACAD. SCI. 8363, 8363-68 (2013).

53. Olivier de Schutter (Special Rapporteur on the Right to Food), *The Transformative Potential of the Right to Food*, U.N. Doc. A/HRC/25/57 (Jan. 24, 2014).

54. Chelsea Smith et al., *Realizing the Right to Food in an Era of Climate Change: The Importance of Small-Scale Farmers*, QUAKER U.N. ORG. (May 2015), http://quno.org/sites/default/files/resources/Realizing%20the%20right%20to%20food%20in%20an%20era%20of%20climate%20change.pdf.

55. EMILE A. FRISON, INT'L PANEL OF EXPERTS ON SUSTAINABLE FOOD SYS., FROM UNIFORMITY TO DIVERSITY: A PARADIGM SHIFT FROM INDUSTRIAL AGRICULTURE TO DIVERSIFIED AGROECOLOGICAL SYSTEMS (2016).

56. Cheryl Lyn Dybas, *Dead Zones Spreading in World Oceans*, 55 BIOSCIENCE 552 (July 1, 2005).

Despite a persistent narrative of the efficiencies of industrial agriculture, data shows that 75-90% of the food we consume is locally produced by small-scale farmers, and they do so on one-quarter of the world's arable land.[57] Agricultural biodiversity underpins the productivity, resilience, and ultimately the security of all food systems. Farmers' plant varieties,[58] as well as their uncultivated and wild species (including those related to domesticated crops), are the dynamic pool of genetic diversity that farmers and the global community will continue to rely on for resistance, tolerance, and immunity to risk factors. It is not just agricultural biodiversity that is so important—it is the small-scale farmers who have been conserving and developing this diversity from the beginnings of agriculture almost 12,000 years ago who continually innovate on the farm and adapt to environmental and socio-economic changes.[59] The genetic diversity of so-called "neglected and underutilized species" (NUS) (e.g., millets, sorghums, groundnuts, and cassava) is particularly underrepresented in gene banks,[60] making on-farm biodiversity even more important.

Small-scale farming with agroecological approaches in agrobiodiverse systems deploying agricultural biodiversity is productive and resilient over time. For instance, data from hundreds of certified-organic, industrial, and low-input farms around the world revealed that introducing agroecological approaches in developing countries led to two to four times the productivity of previous practices.[61] The impact on the global food supply from shifting the planet to organic production was estimated to cause a yield increase for every single food category investigated. In one of the largest studies analyzing the effects of agroecological practices on productivity in the developing world, researchers at the University of Essex in England analyzed 286 projects in fifty-seven

57. United Nations Conference on Trade and Development, *Technology and Innovation Report 2010*, UNCTAD/TIR/2009.

58. In botanical nomenclature, variety is a taxonomic rank below that of species and subspecies but above that of form. INT'L ASSOC. FOR PLANT TAXONOMY, INTERNATIONAL CODE OF NOMENCLATURE FOR ALGAE, FUNGI AND PLANTS art. 4 (2018), https://www.iapt-taxon.org/nomen/main.php.

59. Smith et al., *supra* note 52.

60. BIODIVERSITY INT'L, ON FARM CONSERVATION OF NEGLECTED AND UNDERUTILIZED SPECIES: STATUS, TRENDS AND NOVEL APPROACHES TO COPE WITH CLIMATE CHANGE (S. Padulosi et al. eds. 2012), https://www.bioversityinternational.org/fileadmin/_migrated/uploads/tx_news/On-farm_conservation_of_neglected_and_underutilized_species__status__trends_and_novel_approaches_to_cope_with_climate_change_1512.pdf.

61. Catherine Badgley & Ivette Perfecto, *Can Organic Agriculture Feed the World?*, 110 DIG. COMMONS@UNIV. NEB.-LINCOLN 80, 80-85 (2007), http://digitalcommons.unl.edu/agronomyfacpub/110.

countries.[62] Among the 12.6 million farmers followed who were transitioning toward sustainable agriculture, researchers found an average yield increase of 79% across a wide variety of crop types.[63]

In a comprehensive analysis of world agriculture, several U.N. agencies and the World Bank engaged more than 400 scientists and development experts from eighty countries over four years to produce the International Assessment of Agricultural Knowledge, Science and Technology for Development, which concluded that agroecology and locally-based food economies (rather than the global market) were the best strategies for combating poverty and hunger.[64]

Farming is mainly a private activity implemented locally in most parts of the world by small-scale farmers.[65] Yet their innovative activities, including the ongoing development of agricultural biodiversity through their practices, such as agroecology, are in the public interest. Small-scale farmers are often poor and food-insecure themselves. It is at their expense that the public welfare is subsidized; thus, the poor are subsidizing the global public welfare.

BOX 1[66]

- Most developing countries are agriculture-based economies where small-scale famers account for 75% or more of agricultural production and over 75% of employment.[67]
- At least 70% of the food we consume is produced by the world's 1.5 billion small-scale farmers. In many developing

62. J.N. Pretty et al., *Resource-Conserving Agriculture Increases Yields in Developing Countries*, 40 ENVTL. SCI. & TECH. 1114, 1114–19 (2006).

63. *Id.* at 1114.

64. *See* IAAST, AGRICULTURE AT A CROSSROADS GLOBAL REPORT (2008), https://archive.org/stream/fp_Agriculture_at_a_Crossroads_Global_Report_English/Agriculture%20at%20a%20Crossroads_Global%20Report%20%28English%29_djvu.txt.

65. Graeub et al., *That State of Family Farms in the World*, 87 WORLD DEV. 1 (2016).

66. For more information, see DANIELE GIOVANNUCCI ET AL., U.N. DEP'T. OF ECON. & SOC. AFF. DIV. FOR SUSTAINABLE DEV., FOOD AND AGRICULTURE: THE FUTURE OF SUSTAINABILITY (2012); U.N. DEP'T. OF ECON. & SOC. AFF. DIV. FOR SUSTAINABLE DEV., THE INTERNATIONAL ASSESSMENT OF AGRICULTURE KNOWLEDGE, SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (2008); Sunderland, *supra* note 38.

67. Leah H. Story et al., *Subnational distribution of average farm size and smallholder contributions to global food production*, 11 ENVTL. RES. LETTERS 12 (2016); A VIABLE FOOD FUTURE, UTVIKLING ONDET [THE DEV. FUND], NOR WAY 42, 10i (2011), https://www.ifad.org/documents/38714170/39132730/IFAD+Strategic+Framework+2016-2025/d43eed79-c827-4ae8-b043-09e65977e22d.

countries, the figure is higher, where 75% to 90% of staple food is locally produced by small-scale farmers.[68]

- Agricultural biodiversity continues to evolve through the work of small-scale farmers in their fields. These farmers contribute to the resilience and stability of agricultural production systems. They provide control mechanisms and genetic security for adaptation to unpredictable changes in rainfall and temperatures. This control and security is particularly important today as the effects and uncertainties of climate change become increasingly manifest.[69]
- Agricultural biodiversity and farmers' knowledge and innovative practices offer social and economic opportunities that contribute to livelihoods and to social and cultural values.[70]
- The direct use of agricultural biodiversity is a major contributor to nutrition and health. The World Health Organization estimates that, in many developing countries, up to 80% of the population relies on genetic resources for primary health care.[71]
- Ecological processes such as the maintenance of water cycling, soil fertility, pollination, seed dispersal, and nutrient cycling all rely to a greater or lesser extent on agricultural biological diversity.[72]

68. UTVIKLING ONDET, *supra* note 65.

69. *How does Biodiversity loss affect me and everyone else?*, WORLD WILDLIFE FOUNDATION, http://wwf.panda.org/our_work/biodiversity/biodiversity_and_you/; SUSAN H. BRAGDON, THE FOUNDATIONS OF FOOD SECURITY: ENSURING SUPPORT TO SMALL-SCALE FARMERS MANAGING AGRICULTURAL BIODIVERSITY, QUAKER UNITED NATIONS OFF. (2017), http://quno.org/sites/default/files/resources/FS%20foundation_FINAL_UPDATED.pdf.

70. Sawadogo Mahamadou et al., *Components of the ecosystem as instruments of cultural practices in the in situ conservation of agricultural biodiversity*, 141 PLANT GENETIC RESOURCES NEWSL. 19 (2005); DOUGLAS GOLLIN ET AL., AGRICULTURAL PRODUCTIVITY AND ECONOMIC GROWTH, HANDBOOK OF AGRIC. ECON. (2010); Devra I. Jarvis et al., *An Heuristic Framework for Identifying Multiple Ways of Supporting the Conservation and Use of Traditional Crop Varieties within the Agricultural Production System*, 30 CRITICAL REVS. PLANT SCI. 125 (2011); José Esquinas-Alcázar, *Protecting Crop Genetic Diversity for Food Security: Political, Ethical, and Technical Challenges*, 6 NATURE 946 (2005).

71. WORLD HEALTH ORG., GLOBALIZATION, DIETS AND NONCOMMUNICABLE DISEASE (2002); Emile Frison, *Agricultural Biodiversity for Health and Nutrition*, SCI. ALERT (Nov. 30, 2010), https://www.sciencealert.com/agricultural-biodiversity-for-nutrition-and-health; BIODIVERSITY INT'L, DIVERSIFYING FOOD AND DIETS: USING AGRICULTURAL BIODIVERSITY TO IMPROVE NUTRITION AND HEALTJessica Fano et al. eds., 2013).

72. Jarvis, *supra* note 68; Esquinas-Alcazar, *supra* note 68; Lori Ann Thrupp, *Linking Agricultural Biodiversity and Food Security: The Valuable Role of Sustainable Agriculture*, 76 INT'L AFF. 265, 268 (2000).

- Farmers continue to develop and preserve *in situ* agricultural biodiversity and maintain the associated traditional—and evolving—knowledge. These resources and knowledge are integral to breeding and crop improvements that have potentially global implications.[73]

IV. PPPs AND SDG 2

A. *The Fit between PPPs and Global Development Goals*

Across the SDGs, there has been a blanket call for engaging all sectors in financing global development, with a particular focus on the capabilities and resources of the private sector.[74]

Since their inception, these forms of partnerships for development have been controversial, particularly due to the different motivations of public and private actors in regard to development, as well as the power imbalances that exist between them.[75] The public sector, in theory, is designed to protect the interest of the public at large by achieving social welfare and providing protection against market fluctuations and other forces.[76] The industry sector, by nature, is driven by profit gains achieved by efficiency in production.[77] On its own, it is not equipped to provide universal access to public goods, as this goal is not cohesive with its profit maximization objectives.[78] This is not an indictment of industry, because when it is properly regulated and taxed, the private sector is critical to the health of society. The two sectors are both necessary for the achievement of development goals. However, in the track record of PPPs, power has most often shifted in favor of industry due to

73. SUSAN H. BRAGDON & CHELSEA SMITH, SMALL-SCALE FARMER INNOVATION, QUAKER UNITED NATIONS OFF. (2015).

74. *Addis Ababa Action Agenda of the Third International Conference on Financing for Development*, U.N. Doc A/RES/69/313 (2015).

75. DAVID HALL, PUB. SERVS. INT'L RES. UNIT, WHY PUBLIC-PRIVATE PARTNERSHIPS DON'T WORK: THE MANY ADVANTAGES OF THE PUBLIC ALTERNATIVE 3 (2015), http://www.world-psi.org/sites/default/files/rapport_eng_56pages_a4_lr.pdf.

76. CIVIL SOC'Y REFLECTION GRP., RECLAIMING POLICIES FOR THE PUBLIC: PRIVATIZATION, PARTNERSHIPS, CORPORATE CAPTURE, AND THEIR IMPACT ON SUSTAINABILITY AND INEQUALITY – ASSESSMENTS AND ALTERNATIVES 11 (2017).

77. *Public Private Partnerships and Gender Justice in the Context of the 3rd UN Conference on Financing for Development*, DAWNE (2015), http://dawnnet.org/wp-content/uploads/2015/03/Ffd3_Public-Private-Partnerships-and-Gender-Justice.pdf.

78. DAVID HALL, *supra* note 64.

industry's greater financial resources and a narrative that has cast the government as a bulky, inefficient, and inflexible actor that relies on the private sector to make up for its failures.[79] This rhetoric has also supported continued government partnership with large-scale businesses, rather than smaller-scale actors, in order to achieve maximum efficiency and technical gains.[80]

The results of this type of partnership for development have been mixed at best. This section will briefly trace the history of PPPs for development to determine how they emerged as such a popular means of implementation in the Addis Ababa Agenda. Following this general assessment of PPPs, we will examine the trends and outcomes of PPPs specific to agriculture and food production.

While PPPs have been a part of international development rhetoric for the length of its history, the U.N. Conference on Environment and Development in 1992 was the first global gathering to explicitly call upon various "social groups," including the private sector, to play a role in partnering for development.[81] This was followed by the World Summit on Sustainable Development (WSSD) in 2002, in which the narrative that the public sector was too inefficient and cumbersome to take on the challenge of international development on its own was solidified after progress on certain goals was not being achieved.[82] This gave rise to the idea of "Type II partnerships," defined as collaboration between national or subnational governments and private sector or civil society actors to meet development goals.[83] The intention of these partnerships at that time was to complement, rather than replace, traditional public-sector partnerships. Guidelines for their establishment were outlined in the Bali Guidelines.[84]

Establishing innovative mechanisms for financing sustainable development was the focal point of the 2002 Conference in Monterrey, Mexico, and the private sector has remained actively engaged in the sector ever since.[85] The U.N. Conference on Sustainable Development

79. FRANK BIERMANN ET AL., FONDAZIONE ENI ENRIC MATTEI SERIES INDEX, MULTI-STAKEHOLDER PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT: DOES THE PROMISE HOLD? 2 (2007), https://sustainabledevelopment.un.org/content/documents/1744ENI%20Foundation.pdf.

Id. at 18.

81. Marianne Beisheim & Nils Simon, *Multi-Stakeholder Partnerships for Implementing the 2030 Agenda.: Improving accountability and transparency*, GERMAN INST. FOR INT'L & SEC. AFF. (2016), https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/en/2016doc/partnership-forum-beisheim-simon.pdf.

82. *Id.*

83. *Id.* at 8.

84. *Id.* at 12.

85. Beisheim & Simon, *supra* note 52.

Rio 20+ conference led to over 1,400 partnership commitments, many with the private sector, representing a commitment of $636 million.[86] Between 2007 and 2010, the Organisation for Economic Co-operation and Development (OECD) estimated that donors channeled an extra $669 million into PPPs, with the common aim of achieving greater impact through effectiveness and efficiency, in addition to mobilizing assets and expertise of the private sector.[87] This rhetoric culminated in the Addis Ababa Action Agenda, developed in 2015, which explicitly states that "both public and private investment have key roles to play in infrastructure financing, including through . . . public private partnerships."[88]

Now, in the 2030 Agenda, the U.N. Conference on Trade and Development estimates that $5-7 trillion per year will be needed in order to finance the SDGs.[89] While this seems like a massive endeavor, the Intergovernmental Committee of Experts on Sustainable Development Financing has calculated $80-90 trillion in underutilized assets for investing in development, primarily in private sector resources, and recommends a "crowding in" of corporate financing through blended funding mechanisms.[90] The Committee emphasized the need for governments worldwide to develop policies to "help overcome obstacles to private investment, in conjunction with additional public spending."[91] As we can see through these examples of large-scale agriculture and development agreements, there is an increasing trend of "crowding in corporate investment"—but at what expense?

Frank Biermann, Sander Chan, Aysem Mert, and Phillip Pattberg characterize PPPs as being intended to address three main governance deficits:

---

86. Karin Backstrand & Mikael Kylsater, *Old Wine in New Bottles? The Legitimation and Delegitimation of UN Public-Private Partnerships for Sustainable Development from Johannesburg Summit to Rio 20+ Summit*, 11 GLOBALIZATIONS 331 (May 28, 2014), https://www.tandfonline.com/doi/abs/10.1080/14747731.2014.892398.

87. Evert-jan Quak & Nicole Metz, *Building Partnerships with Whom? Quick Scan of the Key Actors in Food Security Public-Private Partnerships*, FOOD AND BUS. KNOWLEDGE PLATFORM (2015), http://knowledge4food.net/wp-content/uploads/2015/05/150519_fbkp-stakeholder_analysis_PPP.pdf.

88. *Addis Ababa Action Agenda of the Third International Conference on Financing for Development*, UNESA (2015), http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf.

89. Barbara Adams, *United Nations and Business Community, Outsourcing or Crowding in?*, GLOB. POLICY WATCH BRIEFINGS (2016), https://www.globalpolicywatch.org/blog/2016/10/05/un-and-business-community/.

90. *Id.*

91. *Id.*

- regulatory deficits, to fill gaps in cooperation and joint problem-solving when intergovernmental regulation may be ill-equipped or unable to do so;
- implementation deficits, where regulations may exist, but they are poorly implemented; and
- participation deficits, where partnerships are envisioned to ensure higher participation and diversity of actors involved in governance and to reduce the influence of a few powerful states.[92]

However, Biermann, Chan, Mert, and Pattberg's large-scale review of partnerships indicates that areas with higher degrees of regulation attract greater numbers of partnerships, and that such partnerships tend to stay clear of high-risk investments, such as the area of agroforestry.[93] It is hypothesized that this could be because private firms view problems not in terms of urgency, but in terms of investment security and manageability. This does not bode well for the complex and tenuous nature of the problems that the SDGs are trying to solve.[94] In their review, while biodiversity and agriculture did rank in the top five issue areas for WSSD partnerships, issues such as water and energy had almost twice the number of partnerships in the database as agriculture and biodiversity combined.[95]

The idea that PPPs bring new, substantial sources of funding is also questionable, given that at the conclusion of the WSSD, all partnerships had less than $250 million in funding.[96] While that number did increase, it was largely due to the reclassification of PPPs into multi-sectoral partnerships, which allowed them to rely more heavily on U.N. programs and governmental funding to finance the partnerships.[97] Overall, the authors concluded that business actors account for only 1% of new funding, roughly equivalent to that of non-governmental organizations (NGOs).[98]

---

92. Frank Biermann et al., *Multi-Stakeholder Partnerships for Sustainable Development: Does the Promise Hold?* FONDAZIONE ENI ENRIC MATTEI SERIES INDEX (2007), https://sustainabledevelopment.un.org/content/documents/1744ENI%20Foundation.pdf.

93. *Id.* at 5-6.

94. *Id.* at 6.

95. *Id.* at 7.

96. *Id* at 9.

97. Phillip Pattberg & Oscar Widerberg, *Multi-Stakeholder Partnerships: Building Blocks for Success*, INT'L CIV. SOC'Y CTR. (2014), https://www.researchgate.net/publication/281268765_Multistakeholder_Partnerships_Building-Blocs_for_Success.

98. *Id.*

Reviews of PPPs have illustrated that such financing mechanisms for development "contribute to increased inequality both within and between countries."[99] And finally, in order to truly achieve the SDGs and ensure "no one is left behind," the PPPs have not proven their worth, as 56% of partnerships listed have no state partner from the developing world.[100] In other systematic reviews of the PPPs that emerged out the WSSD in Johannesburg and the Rio 20+ Summit, the overall picture of the effectiveness of these partnerships is troubling.[101] The reviews' most common finding was that the partnerships registered or agreed upon in the aftermath of international development agenda-setting are simply not active.[102]

Most of the partnerships lack effective monitoring and evaluation mechanisms, and given that those that do may not be public or independent, it is difficult to establish the relationship between the partnership outputs and the impact on development outcomes.

The rhetoric that PPPs bring efficiency gains and technical capacity to solving inherently pervasive problems has also proven to be problematic. In a review of partnerships related to electricity and water, the private sector failed to lower prices for consumers, potentially due to the poor regulatory environment [at the time], which allowed the private sector to continue to collect profits unabated.[103]

The global public interest orientation of the SDGs also poses a challenge to private sector participation. Partnerships need to be commercially viable in the short term in order to attract private sector investment, but often the protection of the environment and providing decent working conditions for local employees are not immediately profitable business strategies.[104] The returns on these kinds of investment may take time to accumulate, and the private sector may not measure value in the social externalities that emerge. PPPs have also proven

99. Kate Bayliss & Elisa Van Waeyenberge, *Unpacking the Public-Private Partnership Revival*, 54 J. DEV. STUD. 577 (2017), https://tandfonline.com/doi/abs/10.1080/00220388.2017.1303671.

100. Frank Biermann et al., *supra* note 62, at 14.

101. PUBLIC-PRIVATE PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT: EMERGENCE, INFLUENCE, AND LEGITIMACY (Philipp Pattberg et al. eds., 2012); Marco Schaferhoff et al., *Transnational Public-Private Partnerships in International Relations: Making Sense of Concepts, Research Frameworks, and Results*, 11 INT'L STUD. REV. 451 (2009); TRANSNATIONAL PARTNERSHIPS: EFFECTIVELY PROVIDING FOR SUSTAINABLE DEVELOPMENT? (Marianne Beisheim et al. eds., 2014).

102. Schaferhoff, *supra* note 90.

103. *Id.* at 471.

104. David Hall, *Why Public-Private Partnerships Don't Work: The Many Advantages of the Public* Alternative, PUB. SERVS. INT'L RES. UNIT 3. Pp. 34 (2015), http://www.worldpsi.org/sites/default/files/rapport_eng_56pages_a4_lr.pdf.

to be one of the most expensive methods of financing for development for the public sector, since private borrowing rates are double that of government borrowing (7-8% compared to 3-4%).[105]

Despite their long history in development rhetoric, PPPs, in general, have not fulfilled the promises they have made in the form of increased economic gains (except for industry actors themselves), efficiency, and improved provision of traditionally "public goods." Since food and biodiversity are intersectional areas that impact a great number of the SDGs, it is important for us now to turn to whether PPPs in agricultural production hold any possibility for effective partnerships.

B. *Are PPPs Fit to Support Small-Scale Farmers and Biodiversity?*

While it is clear that PPPs generally have not consistently demonstrated the positive impacts that have been promised, what about in food and agriculture, in particular? This section will separately examine the trends in both the private and public sectors related to food and agricultural production, small-scale farmer livelihoods, and agrobiodiversity to determine their theoretical effectiveness, as well as review examples of PPPs in this sector to see if they have exhibited success in practice. In this case, the success of PPPs is measured by their contribution to achieving development goals, conserving biodiversity, protecting small-scale farmer livelihoods, and increasing the supply of affordable and nutrient-dense foods available to the public.

1. Trends in the Private Sector of Food and Agriculture

One of the most defining trends in the agrifood private sector is the overwhelming concentration of power that has taken place. This trend is arising due to pressure from financial investors who are concerned about excessive borrowing by corporations in the context of low agricultural commodity prices.[106] As such, monopolies and oligopolies have emerged in almost all of the major input markets, with some markets reaching concentration ratios well above the threshold for a competitive market.[107] For instance, four companies currently control 56% of the farm machinery industry, valued at approximately $116 billion, which is expanding into automated farm equipment, software technologies, and

105. *Id.*

106. Jennifer Clapp, *Monsanto, Dow, Syngenta: Rush for Mega-Mergers Puts Food Security at Risk*, GUARDIAN (May 5, 2016), https://www.theguardian.com/sustainable-business/2016/may/05/monsanto-dow-syngenta-rush-for-mega-mergers-puts-food-security-at-risk.

107. *Breaking Bad: Big Ag Mega-Mergers in Play*, ETC GROUP (2015), http://www.etcgroup.org/content/breaking-bad-big-ag-mega-mergers-play.

bio-based technologies for seeds and pesticides.[108] One third of the global potash production is controlled by three companies: Potash Corp., Saskatchewan; Agrium, and Mosaic.[109] The "Big Six" of the agrochemical market (Monsanto, Bayer, Syngenta, Dow, DuPont, and BASF) control 75% of the global agrochemical market, 63% of the commercial seed market, and 75% of all private sector research in seeds and pesticides.[110] Their research budget is more than fifteen times the research and development budget of the U.S. Department of Agriculture (USDA), and twenty times that of the Consultative Group on International Agricultural Research Consortium (CGIAR).[111] That is not to mention that five of those companies have pending merger and acquisition deals both with each other and with other mega-corporations, such as ChemChina.[112]

This only touches on the input markets, not taking into account concentration in other areas of the supply chain, such as grain trading. Here, four companies, known as the ABCD companies (Arthur Daniels Midland, Bunge, Cargill, and Louis Dreyfus) control 70% of global grain trading.[113] Beyond that, they also act as landowners, cattle and poultry producers, food processers, transportation providers, biofuel producers, and providers of financial services in commodity markets. While it is challenging to determine the concentration ratios in the food and beverage retail market due to its size and scope, recent major acquisitions such as 3G's takeover of Heinz for $23 billion and Anheuser-Busch InBev's takeover of SABMiller Plc. for $107 billion demonstrate similar trends in concentration of corporate power.[114]

Beyond reducing competition in markets, what is the problem with such large companies having such control over agricultural supply chains? First, there is a lack of consumer choice and a reduction in available information to purchasers, since a number of these

108. *Id.*

109. *Id.* Potash is a potassium-rich salt that is derived from underground deposits and used in fertilizers to increase crop yields and improve plant quality. Rob Mikkelsen, *What is Potash?*, MOSAIC, https://www.cropnutrition.com/what-is-potash (last visited Oct. 1, 2018).

110. Rob Mikkelsen, *supra* note 99.

111. *Id.*

112. *See, e.g.*, Matt Hopkins, *Bayer Wins U.S. Approval for Monsanto Deal*, AGRIBUS. GLOB. (May 29, 2018), https://www.agribusinessglobal.com/industry-news/bayer-wins-u-s-approval-for-monsanto-deal/.

113. Sophia Murphy et al., *Cereal Secrets: The World's Largest Grain Traders and Global Agriculture.*, OXFAM RESEARCH REPORTS (2012), https://www.oxfam.org/sites/www.oxfam.org/files/rr-cereal-secrets-grain-traders-agriculture-30082012-en.pdf.

114. IPES, CORPORATE CONCENTRATION WITHIN THE AGRIFOOD SECTOR (2016), http://www.ipes-food.org/images/Reports/TR3—Concentration-Brief-Oct-2016.pdf.

companies are privately held with boards of directors composed of family members, employees, and a handful of private investors.[115] If consumers cannot access information about the foods they eat and how they are produced, companies are not held accountable for their activities. This ultimately impacts the way that people eat and how their diets are shaped. Further, concentration of power and wealth in a small number of companies strengthens their ability to shape the regulatory context in which they operate in their favor and provides significant price-setting power.[116] Due to the large economies of scale that they are able to achieve through lack of regulation and limited information, they are easily able to crowd smaller producers out of the market, negatively impacting small-scale farmer and producer livelihoods.

The current multilateral intellectual property landscape is, to a large extent, unfavorable or, at best, neutral to small-scale farmers. The creation of new, locally suitable crop varieties by mixing new and traditional varieties is arguably the most critical innovative activity relating to food security and the maintenance of on-farm biodiversity.

The concern is that strengthened plant variety protection (PVP) and breeders' rights that extend breeders' control to the harvest of the farmer's crop can: disrupt the informal seed system; cause the loss of landrace varieties; and restrict the right of farmers to share, use, and save seed from their harvests.[117]

Intellectual Property Rules (IPRs) potentially negatively affect small-scale farmers indirectly if they limit the accessibility of publicly funded research. Since the CGIAR reform was established in 2010, the Group has increasingly collaborated with the private sector, hoping to broaden the impact of their research.[118] The argument is that, with

115. Murphy et al., *supra* note 80.

116. *Id.*

117. Under the Union for the Protection of New Varieties of Plants, protected varieties are generally available for use for the breeding of new varieties, though there are complexities introduced by the concept "essentially derived varieties" and the "legitimate rights of the breeder." Int'l Union for the Prot. of New Varieties of Plants, Explanatory Notes on Essentially Derived Varieties Under the 1991 Act of the UPOV Convention, UPOV/EXN/EDV/2 (Apr. 6, 2017), http://www.upov.int/edocs/expndocs/en/upov_exn_edv.pdf. Nevertheless, if informal seed systems are disrupted and replaced by only more formal systems of supply, small-scale farmers may find they have access only to protected varieties where their ability to save, exchange, and use them in future seasons is increasingly limited. *See also* Devlin Kuyek, *Intellectual Property Rights in African Agriculture: Implications for Small Farmers*, GRAIN (Aug. 2, 2002), https://www.grain.org/article/entries/3-intellectual-property-rights-in-african-agriculture-implications-for-small-farmers.

118. CGIAR, 3-YEAR SYSTEM BUSINESS PLAN COMPANION DOCUMENT: ACTION 7.B: DEEPEN PRIVATE SECTOR COLLABORATION (Sept. 12, 2018), https://www.cgiar.org/wp/wp-content/uploads/2018/09/SMB10-BP7b-Deepen-Private-Sector-Collaboration.pdf.

more agricultural research being undertaken by the private sector, particularly in industrialized countries, the CGIAR increasingly needs to engage with private sector partners to achieve its mission to reduce rural poverty; improve food security, nutrition, and health; and improve the management of natural resources.[119] This has created challenges for producing goods freely available to small-scale farmers,[120] and a departure away from the original mandate to produce international public goods. Discussions about agricultural innovation often fail to recognize the innovations of small-scale farmers themselves, concentrating instead on farmers' adoption of what are argued to be more productive, profitable, and resource-efficient tools and practices, developed within and disseminated by formal institutions.[121]

Arguably the most critical innovative activity relating to food security and the maintenance of on-farm biodiversity is the creation of new, locally suitable crop varieties by small-scale farmers mixing new and traditional varieties. IPR is not at present providing incentives for this innovative activity.[122]

The co-occurrence of corporate consolidation, the strengthening of intellectual property protection, and governments' reluctance to enforce anti-trust law (or competition law) since the 1980s is not a coincidence. Through these mechanisms, corporations increased profits by limiting farmers' choice of input in the market, including the purchase of "improved seeds" such as the "Round-Up Ready" seeds produced by Monsanto that require the use of the "Round-Up" pesticide.[123] As noted in Part III above, this use of chemicals has led to the degradation of soil and natural pest controls. Price-setting power also allows large-scale companies to lower farm-gate prices, or raise the prices of inputs, crowding small-scale farmers out of the market.[124]

---

119. *See How We Work*, CGIAR, https://www.cgiar.org/ (last visited Sept. 24, 2018).

120. *The Intersection of Public Goods, Intellectual Property Rights, and Partnerships: Maximizing Impact for the Poor*, CGIAR CONSORTIUM INT'L AGRIC. RES. CTR. (2011), https://library.cgiar.org/bitstream/handle/10947/2617/The_Intersection_of_Public_Goods_Intellectual_Propery_Rights_and_Partnerships_Maximizing_Impact_for_the_Poor.pdf.

121. *See, e.g.*, *Small-Scale Farmer Innovation Systems*, QUAKER U.N. OFF. (May 27, 2015), http://quno.org/sites/default/files/resources/SSF%20innovation%20consultation%20report_0.pdf; Bekele A. Shiferaw et al., *Adoption and Adaptation of Natural Resource Management Innovations in Smallholder Agriculture: Reflections on Key Lessons and Best Practices*, 11 ENVTL. DEV. SUSTAIN. 601, 602-03 (2009).

122. Smith et al., *supra* note 52.

123. Jennifer Clapp et al., *Bigger Isn't Always Better: What the Proposed Agribusiness Mega Mergers Could Mean for Canada*, FOOD SECURE CAN., https://foodsecurecanada.org/resources-news/news-media/big-6-agribusiness-mega-mergers-canada (last visited Sept. 26, 2018).

124. *Id.*

It is clear that there is an immense power imbalance in the private sector between large-scale agribusinesses and small-scale farmers, with the former taking increasingly large strides towards consolidating their power over the system. Nevertheless, according to common rhetoric, the public sector has failed to support food and agricultural production and is inefficient in its investment, so the private sector has been called to fill in the gaps. However, evidence does not support that position in agriculture. In fact, enchantment with markets and the parallel diminution of the perspective about the role of government in general emerged in the 1980s and, until fairly recently, have been relatively unchallenged.[125] This has enabled the use of markets "to allocate health, education, public safety, national security, criminal justice, environmental protection, recreation, procreation, and other social goods that were for the most part unheard-of 30 years ago."[126]

2. Trends in the Public Sector of Food and Agriculture

While the private sector has been flourishing in an environment of deregulation, public-sector involvement and investment in food and agriculture has been declining and has already been surpassed by that of the private sector.[127] In regions like the Middle East and North Africa (MENA) and Latin America and the Caribbean (LAC), total agricultural expenditure is declining, and in the case of Latin America, by an average of 2% per year.[128] Despite agriculture contributing to almost 30% of Sub-Saharan Africa's GDP growth, agriculture accounted for less than 5% of government expenditure. In developing countries, agricultural expenditure intensity remains very low, at less than 10% across regions.[129]

Yet evidence has shown significant potential for agricultural investments to have a positive impact on health and nutrition through access

125. JUNE A. SEKERA, THE PUBLIC ECONOMY IN CRISIS: A CALL FOR A NEW PUBLIC ECONOMICS (2016); JAMES K. GALBRAITH, THE PREDATOR STATE: HOW CONSERVATIVES HAVE ABANDONED THE FREE MARKET AND WHY LIBERALS SHOULD TOO (2008).

126. Michael J. Sandel, *What Isn't for Sale?*, ATLANTIC (Apr. 2012), https://www.theatlantic.com/magazine/archive/2012/04/what-isnt-for-sale/308902/. For excellent work on the importance of accountable, democratic governance and a mixed economy, see Anne Orford, *Food Security, Free Trade and the Battle for the State*, 11 J. INT'L L. & INT'L REL. 1 (2015); SEKERA, *supra* note 116.

127. Tewodaj Mogues et al., *The Impacts of Public Investment in and for Agriculture: Synthesis of Existing Evidence*, FOOD & AGRIC. ORG. OF U.N. (Oct. 2012), http://www.fao.org/docrep/016/ap108e/ap108e.pdf.

128. *Id.*

129. *Id.*

to locally-grown foods, the reduction of food prices, and increases in small-scale farmers' income, leading to better access to health services.[130] Public investment in agricultural research and development has been proven to have the single largest effect on growth in the sector. Public sector investment has also proven to be critical for: compensating for market failures; the protection of public goods, such as biodiversity and natural resources, that are likely to be underprovided by the public sector; mitigating externalities such as environmental degradation; correcting information asymmetries and imperfect competition in markets; and supporting equality and poverty reduction through agricultural investment returns, which produces stronger and more stable effects than that of the private sector.[131]

If governments are not investing in agriculture, whether generally or in R&D, what are they spending on? There has been a rise in healthcare expenditure, specifically in places where agricultural spending is declining such as the Latin American and Caribbean region, the Middle East, and North Africa.[132] This increase in public health spending correlates with rising costs of treating non-communicable diseases, such as diabetes, cardiovascular disease, and cancer, which are no longer confined to the health systems of developed countries. Developing countries now bear the overwhelming burden of both undernutrition and non-communicable diseases, and these diseases are proving costly to treat.[133] In the Americas, the cost of new cancer cases alone in 2009 was $153 billion for only the first year after diagnosis, including medical costs, non-medical costs, and lost productivity.[134] In 2000, the cost of diabetes treatment was $65 billion, and the burden of disease has only increased, now making up 9% of total health expenditure in Central and South America.[135] From 2006 to 2015, the cumulative cost of

130. *Agriculture and Public Health: Impacts and Pathways for Better Coherence*, EUR. PUB. HEALTH ALLIANCE (May 2016), https://epha.org/wp-content/uploads/2016/05/Agriculture-and-Public-Health_EPHA_May2016-2.pdf.

131. Mogues et al., *supra* note 118, at 42–46.

132. *See id.* at 20–21 (noting that healthcare expenditure in Latin America and the Caribbean has risen by about 23% from 2000 to 2007, and that all other regions experienced growth rates of health expenditure higher than 4.9%).

133. Janusz Kaczorowski et al., *Reducing Deaths by Diet*, 62(6) CAN. FAM. PHYSICIAN 469 (June 2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4907549/; Mark Bittman, *How to Save a Trillion Dollars*, N.Y. TIMES: OPINIONATOR (Apr. 12, 2011, 8:30 PM), https://opinionator.blogs.nytimes.com/2011/04/12/how-to-save-a-trillion-dollars/.

134. *The Economic Burden of Non-Communicable Diseases in the Americas*, PAN AM. HEALTH ORG., https://www.paho.org/hq/dmdocuments/2011/paho-policy-brief-3-En-web1.pdf (last visited Sept. 26, 2018).

135. *Id.*

cardiovascular disease, stroke, and diabetes reached as much as $13.54 billion in the economies of four Latin American countries alone.[136]

It appears that there is an increasing proportion of government budgets being allocated for the treatment (rather than prevention) of non-communicable diseases, many of which are in some way related to dietary composition. The shift towards dietary simplification, increased rates of food processing, and distancing consumers from where their food was grown have all been linked to poor health outcomes.[137] If public sector expenditure on agriculture is proven to have a high rate of economic and social return, why then is it in a state of decline?

3. Reviewing existing PPPs in food and agriculture

Although the systematic assessment of PPPs in food and agriculture is limited, a few frameworks and agreements exist through which we can examine the successes and failures of these partnerships. Similar to other PPPs for development, PPPs for food and agriculture often fail to reach their stated purposes of promoting greater efficiency and technical capacities in production. A survey conducted by the International Food Policy Research Institute in 2005 illustrated that out of 124 PPPs for agricultural innovation in South America, many did not achieve complementary use of resources, co-innovation, and joint learning; did not respond to common interests; and were not based on any form of real demand for the partnership.[138]

Given the inherent difficulties of partnering with dispersed farmers who lack formal organization, large-scale PPP actors are likely to partner with large farming operations that already exist. The lack of participation by marginalized groups, whom PPPs and Multi-Stakeholder Partnerships (MSPs) are intended to help, was made evident in a 2006 survey of registered U.N. partnerships, in which less than 1% had partners from groups such as farmers, workers and trade unions, indigenous peoples, women, youth, or children.[139]

---

136. *Id.*

137. *Tackling Non-Communicable Diseases to Enhance Sustainable Development*, NCD ALLIANCE, https://ncdalliance.org/sites/default/files/NCD%20Alliance%20-%20NCDs%20and%20Sustainable%20Development%20Brief_0.pdf (last visited Sept. 26, 2018).

138. FRANK HARTWICH ET AL., INT'L FOOD POL'Y RES. INST., PUBLIC-PRIVATE PARTNERSHIPS FOR INNOVATION-LED GROWTH IN AGRICHAINS: A USEFUL TOOL FOR DEVELOPMENT IN LATIN AMERICA? 2, 30 (Sept. 2005), http://ageconsearch.umn.edu/bitstream/59693/2/isnardp01.pdf.

139. *See* Philipp Pattberg & Oscar Widerberg, *Transnational Multistakeholder Partnerships for Sustainable Development: Conditions for Success*, 45 AMBIO 42, 44-45 fig.2 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4709349/pdf/13280_2015_Article_684.pdf.

Beyond the problem of failing to achieve the goals of greater efficiency, inclusive development, and increasing the availability of technical and financial resources, large-scale PPPs in agriculture have proven, in some cases, to be more harmful than helpful.[140] This is because partnerships between large foreign companies and national governments require strong governance mechanisms and legal frameworks for their regulation.[141] In developing countries, arguably where the most resources are needed to advance sustainable development, PPPs carry an inherent risk given the lack of available capacity, challenges to regulation, and the small number of institutions able to represent groups such as small-scale farmers.[142]

An example of such a partnership agreement is the 2012 G8 Alliance for Food Security and Nutrition, which was developed to raise fifty million people out of poverty in ten years, with supported countries developing cooperation frameworks with private firms.[143] It has received more than $5 billion in commitments from governments to the private sector and supports "public-private partnerships with adequate emphasis on the development of infrastructure aimed at increasing resources for agriculture and improving investment effectiveness."[144] The Alliance constitutes a "mega" partnership by creating incentives through policy for the private sector and by investing in large scale infrastructure development to encourage further investment in developing countries' agriculture.[145] The primary goal of attracting this investment in agriculture is to create efficiency gains and increase productivity, as well as increase the quantity of food exported to spur economic growth.[146]

However, foreign investors have taken this Alliance as a free pass to extend their reach to African agricultural land. For instance, in one Alliance target country, government officials have already agreed to alter laws related to long-term land leases to make the climate more

140. Frank Biermann et al., *Multi-Stakeholder Partnerships for Sustainable Development: Does the Promise Hold?* 2 (Fondazione Eni Enrico Mattei CSR Paper No. 28, December 2007), https://sustainabledevelopment.un.org/content/documents/1744ENI%20Foundation.pdf.

141. OXFAM INT'L, MORAL HAZARD? "MEGA" PUBLIC–PRIVATE PARTNERSHIPS IN AFRICAN AGRICULTURE 15 (Sept. 1, 2014), https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/oxfam_moral_hazard_ppp-agriculture-africa-010914-embargo-en.pdf.

142. *Id.*

143. Quak & Metz, *supra* note 78.

144. G8 2009 Summit, "L'Aquila" Joint Statement on Global Food Security ¶ 5 (July 10, 2009), https://www.mofa.go.jp/policy/economy/summit/2009/statement3-2.pdf.

145. Pattberg & Widerberg, *supra* note 130, 9-10.

146. *Id.*

favorable for investment.[147] In another, land investors have already put in offers for over 1.26 million hectares of agricultural land.[148] Asymmetries of power in these partnership agreements also become increasingly evident as one reads the text of the cooperation frameworks contained within the Alliance. One developing country has committed to "systematically ceasing to distribute free and unimproved [non-commercial] seeds to farmers, except in emergencies," illustrating the control that partnering companies such as Syngenta, BASF, and Bayer have over the narrative guiding these partnerships.[149]

The World Economic Forum has also initiated the GROW Africa platform for PPPs to connect developing countries with private sector firms.[150] Growth corridor programs have also been supported through these partnerships mechanisms, including the Ghana Commercial Agricultural Project and the Southern Agricultural Growth Corridor of Tanzania.[151] Companies involved in the Corridor program in South and East Africa include Monsanto, Syngenta, DuPont, Unilever, General Mills, Bayer, and Nestle.[152] The land along these corridors is often advertised and transferred to foreign investors as "idle" or "underutilized," and investors are sought to develop the infrastructure to increase access for agribusinesses to regional and global markets.[153]

These advertisements of land to foreign entities have severe implications for land rights of individuals living within PPP countries. In one developing country, the government is thought to have offered land to investors at as low a cost as $1 per hectare per annum, drastically undervaluing it, while simultaneously offering extremely low corporate tax rates and import duty exemptions.[154] Given that only a small amount of land in regions such as Sub-Saharan Africa (estimated at less than 10%) is legally registered to its users, this may cause a number of small-scale farmers and rural residents to be forced from their lands with little or

147. Kirtana Chandrasekaran & Nnimmo Bassey, *G8's New Alliance for Food Security and Nutrition Is a Flawed Project*, GUARDIAN (June 7, 2013, 1:42 PM), https://www.theguardian.com/global-development/poverty-matters/2013/jun/07/g8-new-alliance-flawed-project.

148. OXFAM INT'L, *supra* note 132, at 17.

149. *Id.*

150. A.T. KEARNEY, GROW AFRICA: PARTNERING TO ACHIEVE AFRICAN AGRICULTURE TRANSFORMATION, WORLD ECON. FORUM (2016).

151. OXFAM INT'L, *supra* note 132, at 15.

152. *Id.* at 29.

153. *Id.* at 10.

154. *Id.* at 17.

no compensation.[155] In another example, an EU-supported PPP intended to bring small-scale farmers into the supply chain of a developing country's sugar industry.[156] Nevertheless, customary land tenure rights were overruled in favor of foreign investors and local elites, displacing small-scale farmers rather than bringing them into the supply chain. These cases demonstrate how PPPs in agriculture can result in inequitable land tenure agreements that favor large-scale agribusinesses and foreign investors, while disadvantaging small-scale farmers.

Small-scale farmers experience further disenfranchisement when PPPs are implemented through contract farming models (sometimes referred to as outgrower schemes) that see large swaths of land leased to investors, leaving small-scale farmers with earmarked pieces of land adjacent to these lands.[157] The intention is to create agricultural hubs that will better connect small-scale farmers to markets through access to inputs and extension services.[158] However, small-scale farmers often end up indebted to the investing companies for the cost of developing the land, and this debt is commonly paid by the company taking a percentage of the money made from the farmers' sale of goods.[159]

Indebtedness puts small-scale farmers in volatile positions, especially in instances of currency devaluations. Small-scale farmers frequently lack access to social programs and safety nets.[160] In some instances, small-scale farmers become dependent on the plantations for their inputs, preventing them from engaging in traditional methods of agriculture, leading them to rely on agrochemicals and "improved varieties" of seeds, and limiting their ability to conserve and manage biodiversity in their crops.[161] Further, in some instances, the plantations often do not uphold the agreement that they will buy crops from farmers participating in contract farming, and farmers are often left with

155. FRANK F.K. BYAMUGIHSA, SECURING AFRICA'S LAND FOR SHARED PROSPERITY: A PROGRAM TO SCALE UP REFORMS AND INVESTMENTS 55, 104–05 (2013).

156. OXFAM.ORG, *supra* note 110, at 19.

157. *Id.* at 22; Katharina Felgenhauer & Denise Wolter, *Outgrower Schemes–Why Big Multinationals Link Up with African Smallholders*, OECD, www.oecd.org/dev/41302136.pdf (last visited Sept. 26, 2018) ("Outgrower schemes, also known as contract farming, are broadly defined as binding arrangements through which a firm ensures its supply of agricultural products by individual or groups of farmers.").

158. OXFAM INT'L, *supra* note 132, at 22-23.

159. *Id.*

160. *Id.* at 22.

161. *Id.* at 28-29.

surpluses of hybrid varieties that are not in demand in their local markets.[162]

This will continue to be a problem as OECD donors are increasingly funding companies headquartered in their own countries to fulfill PPPs in developing states.[163] For instance, in its commitments to the Southern Agricultural Growth Corridor of Tanzania in a South and East African country, a developed-country donor has provided financial support to the fertilizer company Yara for the development of a fertilizer terminal in a country in East Africa.[164] Germany has also launched a partnership with Bayer and BASF, two corporations that, together, control 31% of the agrochemical market, which is set to increase even more pending the proposed merger between Bayer and Monsanto.[165] The stated purpose of this partnership is to "expand local agri-food value chains in developing and emerging markets, with the aim of enhancing food security in the developing world."[166] The involvement of these companies and the focus on bringing farmers into value chains illustrates a favoring of the industrial production model, which puts biodiversity and the livelihoods of small-scale farmers at risk.

Aysem Mert and Sander Chan also describe how the private sector has pushed forward the use of what they describe as "controversial technologies" through U.N. partnership agreements, particularly because of the lack of accountability and follow-up processes.[167] They state that "partnerships are not just neutral instruments for implementing internationally accepted sustainability norms . . . but rather sites of contestation over distinct technologies and practices."[168] This has been particularly pertinent in the space surrounding food security, small-scale farming, and agrobiodiversity, with the Alliance for a Green Revolution in Africa (AGRA) supporting wide-scale adoption of biotechnologies and industrial inputs in order to increase agricultural

162. *Id.* at 22-23.

163. *Id.* at 30; Biermann et al., *supra* note 131, at 14–19.

164. OXFM INT'L, *supra* note 132, at 28.

165. Dario Sarmadi, *German Food Partnership brings private sector to the table*, EURACTIV (Nov. 19, 2013), https://www.euractiv.com/section/agriculture-food/news/german-food-partnership-brings-private-sector-to-the-table; BREAKING BAD: BIG AG MEGA-MERGERS IN PLAY, ETC GROUP 5 (Dec. 2015), http://www.etcgroup.org/content/breaking-bad-big-ag-mega-mergers-play.

166. Sarmadi, *supra* note 156.

167. Aysem Mert & Sander Chan, *The Politics of Partnerships for Sustainable Development*, *in* PUBLIC–PRIVATE PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT: EMERGENCE, INFLUENCE AND LEGITIMACY 21 (Philipp Pattberg et al. eds., 2012).

168. Philipp Pattberg et al., *Conclusions: partnerships for sustainable development, in* PUBLIC-PRIVATE PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT: EMERGENCE, INFLUENCE AND LEGITIMACY 239, 244 (Philipp Pattberg et al. eds., 2012).

yields for improved food security without a lot of pushback from governments.[169] Such support for technology-based solutions is driven and compounded by the fact that Cargill, Inc., Syngenta, and Yara, megafirms in the agricultural input sectors, are listed as supporters of AGRA.[170]

The focus on biotechnology adoption and increasing industrial inputs is captured by Hannington Odame and Elijah Muange in their case study of the "poster child" for AGRA: Kenya supports several major PPPs seeking to build on a strong, formal private sector for seeds and a well-developed and extensive network of small-scale agro-dealers to promote the spread of new agricultural technologies.[171] They report, however, that agro-dealers are spread unevenly throughout this country and are inevitably concentrated in the higher-potential agricultural areas.[172] With funding from both philanthropic foundations and government, these small-scale rural entrepreneurs are now being provided with a range of technical support from international NGOs, including training in business management.[173] Nevertheless, making a business out of selling seeds and fertilizers to poor farmers is risky, especially in the dry land areas where demand is low and often variable. As Odame and Muange report, links with particular seed companies are essential for the survival of these small scale enterprises, but the changing structure of the national seed industry and the entry of large multinational players is changing this dynamic.[174]

This is serving to narrow the choice of seeds and crop types for farmers in all areas.[175] Moreover, these alliances have, thus far, largely ignored farmers' seed systems, which often serve the majority of poor farmers in more marginal areas, and therefore remain beyond the

169. Rachel Bezner Kerr, *Lessons from the old Green Revolution for the new: Social, environmental and nutritional issues for agricultural change in Africa*, 12 PROGRESS DEV. STUD. 213 (2012).

170. AGRA, https://agra.org (last visited Sept. 26, 2018).

171. *See* Hannington Odame & Elijah Muange, *Can Agro-dealers Deliver the Green Revolution to Kenya?*, 42 INST. FOR DEV. STUD. BULL., 78, 78 (2011), https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/7619/IDSB_42_4_10.1111-j.1759-5436.2011.00238.x.pdf.

172. *Id.*

173. *Id.*

174. *Id.* at 78, 86.

175. Kirtana Chandrasekaran & Nnimmo Bassey, *G8's New Alliance for Food Security and Nutrition Is a Flawed Project*, GUARDIAN (June 7, 2013, 1:42 PM), https://www.theguardian.com/global-development/poverty-matters/2013/jun/07/g8-new-alliance-flawed-project; Kerr, *supra* note 160.

reach of new initiatives and investments.[176] The farmers' systems of seed supply and crop development remain by far the most important source of seed in most farming systems of the world.[177] As noted by Almekinders and Louwaars:

> The importance of farmers' seed systems merits that closer attention be paid to farmers' seed production and seed exchange at the policy level and in technical assistance projects. Linking formal and farmers' seed systems and improving the latter may in many cases be a more effective strategy to improve national and local seed supply than aiming only at improving the infrastructure and investment climate for the formal (private and public) seed sector.[178]

If the transformations needed to align agricultural production with the SDGs are to be broad-based, inclusive, and focused on poverty reduction, as well as yield increases and production growth, those who miss out on the mainstream must be a concern for they represent the majority of Africa's population.[179] Here, the public sector becomes key. This may be an unfashionable focus in the welter of discussion about PPPs and new forms of African entrepreneurship, but in this field, there are some basic public goods which are necessary for a wider ambition to be realized.

PPPs are creating a situation where agribusiness is starting to dominate the profitable agricultural sectors, squeezing out others in the process. As a consequence, a dualistic scenario is emerging where wealthy entrepreneurs, linked to foreign capital and connections to political elites, are making money from agriculture, but others are languishing behind.[180] All of these contributions suggest the need to focus development efforts not just on technical, economic, and institutional policy measures, but to pay more attention to more fundamental political processes of agrarian reform.

This dualistic model of a vibrant commercial agriculture engaging with world markets, attracting external investment, meeting sanitary

176. *Id.*

177. Conny J. M. Almekinders & Niels P. Louwaars, *The Importance of the Farmers' Seed Systems in a Functional National Seed Sector*, 4 J. NEW SEEDS 15, 16 (2002), https://www.researchgate.net/publication/40792159_The_Importance_of_the_Farmers'_Seed_Systems_in_a_Functional_National_Seed_Sector.

178. *Id.*

179. OXFAM INT'L, *supra* note 132, at 5.

180. *Id.* at 18-19; 28-30.

and phytosanitary (SPS) standards, and earning foreign currency alongside a struggling smallholder sector that gradually withers away over time is consistent with a "modernization" view of African agriculture that is popular with many African governments and donors.[181] But how likely is it that new commercial entrants in Africa will survive in the cut-throat world of global agriculture markets? Can SPS standards realistically be met by African farmers and pastoralists as these standards are ratcheted ever upwards by importing countries? Will African governments have the capacity to take others to World Trade Organization dispute panels without retribution or penalty? Will the playing field ever be truly level? And what would be the impact on agricultural biodiversity—an important local and public good—if all farmers were able to engage in markets in this manner? Can a dualistic model ever achieve the SDGs that require an integration of food, nutrition, and the health of people and planet?

With the policy focus now dominated by a commercial agribusiness model, there have been indirect impacts on traditional areas of public research and extension, changing priorities and practice at regional and national levels, and a reduction of opportunities to promote a more participatory, farmer-led approach.[182] This serves a particular set of political and economic interests, whereby a close alliance between the state, local and foreign capital and businesses, and donors and NGOs, constructs a particular vision of the future of agriculture.[183]

As a result, there is no separation of policy prioritization, investment, regulation, and production. As Kojo Sebastian Amanor argues, this apparently "universalizing consensus" acts to exclude alternative perspectives and practices in agriculture, suggesting that there is only one pathway to a new Green Revolution in Africa when, of course, there are—or could be—many.[184]

4. Potential Conflicts of Interest in PPPs

When powerful, increasingly consolidated corporate actors in food systems engage in policy and regulatory discussions and in the decisions

181. *See* Steven Jaffee et al., *Modernizing Africa's Agro-Food Systems: Analytical Framework and Implications for Operations* 10-12, 16 (Afr. Region Working Paper Ser., no. 44, 2003).

182. Kojo Sebastian Amanor, *From Farmer Participation to Pro-poor Seed Markets: The Political Economy of Commercial Cereal Seed Networks in Ghana*, 42 INST. DEV. STUD. BULL. 48 (2011); David J. Spielman & Klaus von Grebmer, *Public-Private Partnerships in International Agricultural Research: An Analysis of Constraints*, J. TECH. TRANSFER 31 (2006).

183. Kojo Sebastian Amanor, *supra* note 173.

184. *Id.*

of governments, individually or collectively, one must be watchful for a structural conflict of interest that cannot be brushed aside or softened with the language of PPP. As noted above, corporate interests have heavily influenced trade rules which, among other factors, have facilitated the spread of industrial agriculture globally with a corresponding increase in obesity, malnourishment, and diet-related disease. The approach of corporate actors favors uniformity and, at present, is not required to account for health, environmental, or other costs borne by society at large.[185] The involvement of corporate actors must be monitored carefully for conflicts of interest with the public interest in food systems that are healthy for people and the planet.

V. Conclusion: Addressing the Assumptions Underlying Agricultural Development

If, similar to other PPPs for development, PPPs for food and agriculture often fail to reach their stated purposes of promoting greater efficiency and technical capacities in production, why do they continue to be promoted without demand for more evidence? The evidence seems clear thus far that PPPs are not boldly transforming our world into a system that feeds and nourishes people and works within planetary boundaries. What could change to make these hybrid institutions more effective in delivering on their promises?

In order for PPPs to achieve gains in this area, they will need to address dominant assumptions (and even ideological myths and economic dogma) that currently frame the policy discussions around food security. We suggest that these assumptions may often be formulated by those in positions of power and with entrenched interests in order to appeal to a natural desire for quick fixes in the face of difficulty in dealing with complexity, as well as fears of climate change and other threats such as growing populations and hunger. These assumptions include:

1) Production is the core issue in addressing food and nutrition security. One frequent statement is the need to double production by 2050 to feed a growing population;
2) Technological solutions are required to address hunger in an era of climate change, a growing world population, and changing diets;
3) The private sector and markets need to be unleashed as the most effective and efficient way to address hunger; and

185. Clapp, *supra* note 35; Oxfam Int'l, *supra* note 132, at 5.

4) Innovative financing mechanisms are necessary to eliminate world hunger.

Essentially, each assumption must be turned on its head. We consider each in turn below.

A. *Agricultural Production Must be Doubled*

In terms of production, the world already produces more than 1.5 times the amount of food needed to feed everyone on the planet.[186] That is enough to feed ten billion people, the population peak we expect by 2050.[187] Nevertheless, we often hear that the world needs to double food production by 2050 to feed the planet.[188] The reference for this claim, if any, is to a 2006 FAO report, World Agriculture: Towards 2030/2050.[189] The figure frightens people and is repeated by agribusiness to promote a sense of urgency and attraction to quick fixes.[190] The only problem is the report does not say this.[191]

As this Paper describes, trends in the *way* we produce food are worrisome, but scarcity is not the core challenge. Even in the context of meat consumption, there is an assumption that the trend towards

186. FAOSTAT Food Production, http://faostat.fao.org/site/612/DesktopDefault.aspx?PageID=612#ancor (select "Net per capita. Production Index100 = 2004-2006") (noting that in the 1960s, the Index Number was between 75 and 77, whereas in 2010 it was 105, and FAO's estimate of calories available show a 22% increase from the mid-1960s to 2007, the latest year for which data is provided) (last visited June 16, 2017).

187. World Population Prospects, United Nations, https://population.un.org/wpp/Publications/ (last visited Jan. 19, 2019).

188. Dan Nosowitz, *Do We Really Need to Double Food Production to Feed the World by 2050?*, MOD. FARMER (Feb. 27, 2017), https://modernfarmer.com/2017/02/really-need-double-food-production-feed-world-2050/.

189. Nikos Alexandratos & Jelle Bruinsma, *World Agriculture Towards 2030/2050* (2012 Revision, ESA Working Paper No. 12-03, June 2012), http://www.fao.org/fileadmin/templates/esa/Global_persepctives/world_ag_2030_50_2012_rev.pdf.

190. Ed Cohen, *Monsanto Exec Says Food Production Will Have to Double in the Next 40 Years*, MENDOZA C. BUS. (Mar. 4, 2011), http://mendoza.nd.edu/ideas-news/news/monsanto-exec-says-food-production-will-have-to-double-in-the-next-40-years/; *World's Ag Production Needs to Double in 25 Years*, SOUTHWEST FARMPRESS, (Feb. 15, 2005), http://www.southwestfarmpress.com/worlds-ag-production-needs-double-25-years.

191. In an analysis by Luigi Guarino, the only reference to a doubling or 100% increase by 2050 came in the context of meat consumption in developing countries (minus China) on page five of the original report. Luigi Guarino, *Quibbling While the World Burns*, AGRICULTURAL BIODIVERSITY WEBLOG (Apr. 22, 2010), http://agro.biodiver.se/2010/04/quibbling-while-the-world-burns/.

increased meat consumption is inevitable.[192] Yet excess meat consumption is a product of cultural norms and artificially cheap meat,[193] both of which can change. Excess meat consumption is associated with heart disease, stroke, diabetes, certain cancers, and early death.[194] Because of these links to health outcomes, since 2005, Americans are eating 20% less beef,[195] and in China, the 2016 dietary guidelines called for cutting meat consumption by 50%.[196]

In sum, any solution to food security challenges that focuses on production misses the point that food security is more about poverty and inequality than about production. Ironically, roughly 70% of chronically hungry people are involved in food production as small-scale farmers and agricultural laborers.[197] According to United Nations Conference on Trade and Development's *Trade and Environment Review 2013: Wake Up Before It Is Too Late*, "hunger and malnutrition are not phenomena of insufficient physical supply, but results of prevailing poverty and, above all, problems with access to food."[198] In reality, the

192. Hannah Devlon, *Rising Global Meat Consumption 'Will Devastate Environment': Analysis Suggests Eating of Meat will Climb Steeply and Play Significant Role in Increasing Carbon Emissions and Reducing Biodiversity*, GUARDIAN (July 19, 2018), https://www.theguardian.com/environment/2018/jul/19/rising-global-meat-consumption-will-devastate-environment.

193. Examples of how meat can be made artificially cheap in many developed countries include the meat industry buying feed grains at prices below what it costs the farmer to produce them, not being required to pay to clean up sewage from concentrated feeding operations, or for the health care costs resulting from increased meat consumption. Tony Weis, *Meatification and the Madness of the Doubling Narrative*, 2 CAN. FOOD STUD. 296 (Sept. 2015); U.S. GOV'T ACCOUNTABILITY OFF., GAO-08-944 CONCENTRATED ANIMAL FEEDING OPERATION: EPA NEEDS MORE INFORMATION AND A CLEARLY DEFINED STRATEGY TO PROTECT AIR AND WATER QUALITY FROM POLLUTANTS OF CONCERN (2008).

194. Mike Smith, *Health & Environmental Implications of U.S. Meat Consumption & Production*, CTR. LIVABLE FUTURE, http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/projects/meatless_monday/resources/meat_consumption.html (lasted visited Oct. 1, 2018).

195. Sujatha Jahagirdar, *Less Beef, Less Carbon*, NRDC (Mar. 22, 2017), https://www.nrdc.org/experts/sujatha-jahagirdar/less-beef-less-carbon.

196. Stuart Leavenworth & Oliver Millman, *China's Plan to Cut Meat Consumption by 50% Cheered by Climate Campaigners*, GUARDIAN (June 20, 2016), https://www.theguardian.com/world/2016/jun/20/chinas-meat-consumption-climate-change.

197. Michael Herrmann, UNCTAD, Food Security and Agricultural Development in Times of High Commodity Prices (Discussion Paper No. 196, Nov. 2009), http://unctad.org/en/Docs/osgdp20094_en.pdf.

198. UNCTAD, *Trade and Environment Review 2013: Wake up Before It Is Too Late*, UNCTAD/DITC/TED/2012/3, at 4 (2013).

bulk of industrially-produced grain crops goes to biofuels and confined animal feedlots rather than to food for the one billion hungry.[199]

B. *Technology Solutions are Key*

The narrative that the key to food security is increased food production is often paired with the belief that the fastest means of increasing food production is high-input, technology-driven industrial agriculture.[200] As discussed above, this approach presumes that the underlying problem is a technical one that can therefore be solved by a technical solution. But it ignores the social, political, and economic forces behind a food system that is broken and is failing more people each year.[201] Technical solutions, such as genetic engineering or biofortification, are largely ill-equipped to address issues of complexity, diversity, and uncertainty.[202]

The risk with technical solutions is agricultural uniformity, which results in an inability to adapt.[203] This model also reinforces inequities in power that keep people hungry.[204] Whether relying on genetically modified organisms (GMOs) or other patented seeds, this model traps farmers into dependence on corporate input suppliers, as well as on banks and moneylenders for low-interest credit to buy them.[205] This is not to say there is no role for biotechnology in addressing hunger. With

199. Eric Holt-Gimenez, *We Already Grow Enough Food for 10 Billion People – and We Still Can't End Hunger*, HUFFPOST (Dec. 18, 2014), http://www.huffingtonpost.com/eric-holt-gimenez/world-hunger_b_1463429; Foley et al., *supra* note 46.

200. *See, e.g.*, ROBERT PAARLBERG, STARVED FOR SCIENCE: HOW BIOTECHNOLOGY IS BEING KEPT OUT OF AFRICA (2008).

201. Patrick Webb, *The Role of Diets in the Shaping the Global Burden of Disease*, GLOB. PANEL AGRIC. & FOOD SYS. FOR NUTRITION, https://glopan.org/news/role-diets-shaping-global-burden-disease (last visited Oct 1, 2018) ("[U]nless something changes in the coming decades, undernutrition and nutrient deficiencies will continue to maim and kill, while diabetes, heart disease and other diet-related chronic diseases will become the dominant contributor to the global disease burden."); *see also Obesity Trends*, HARV. SCH. PUB. HEALTH, https://www.hsph.harvard.edu/obesity-prevention-source/obesity-trends/ (last visited Oct 1, 2018).

202. Emile A. Frison, *supra* note 53.

203. SUSAN H. BRAGDON, QUAKER U.N. OFFICE, THE FOUNDATIONS OF FOOD SECURITY: ENSURING SUPPORT TO SMALL-SCALE FARMERS MANAGING AGRICULTURAL BIODIVERSITY (2017).

204. Elenita C. Daño, *Getting Farmers off the Treadmill. Addressing Concentration in Agricultural Inputs, Processing and Retail Markets, in* UNCTAD, TRADE AND ENVIRONMENT REVIEW 2013: WAKE UP BEFORE IT IS TOO LATE 285 (2013); INT'L PANEL OF EXPERTS ON SUSTAINABLE FOOD SYS., *The New Science of Sustainable Food Systems: Overcoming Barriers to Food Systems Reform* (May 2015), http://www.ipes-food.org/_img/upload/files/NewScienceofSusFood.pdf.

205. T. Vijay Kumar et al., *Ecologically Sound, Economically Viable: Community-Managed Sustainable Agriculture in Andhra Pradesh, India*, WORLD BANK (2009), http://documents.worldbank.org/curated/en/805101468267916659/pdf/759610WP0P118800agriculture0AP02009.pdf.

proper assessment, we want all of the tools in the toolbox. But to truly achieve food and nutrition security, there must be a wider exploration of socio-technological solutions and innovation pathways.

C. *Private Sector Efforts are the Most Efficient*

A focus on technical solutions may also coincide with multinational interests in the seed and agricultural inputs sector. In this context, PPPs in agriculture are thought to be necessary in order to modernize agriculture in developing countries and to prevent the public sector failures that are claimed to be at fault in the failed delivery of other public goods, such as food security, roads, education, and health.[206] Given the need for investment in countries with weak infrastructure and lower credit ratings, partnering with the public sector is intended to incentivize the private sector to invest in countries that would otherwise be too "high risk."[207] Public sector actors are incentivized to pursue these partnerships in order to access advanced agricultural research and development projects to address some of the major problems plaguing developing country agriculture, including pests and disease outbreaks, climate change, post-harvest loss, and food safety.[208] With scores on the agricultural orientation index declining for developing countries in recent years and a slowdown of public investment in publicly funded agricultural R&D, PPPs are seen as a means of filling this gap while using fewer resources.[209]

It is important to emphasize that the narrative of government failure that guides the principle of relying on the private sector for development does not hold true. Government intervention into the economy is necessary for preventing market failures, including negative externalities that will impact our ability to achieve the SDGs. Pertinent examples in agriculture include overuse of water for irrigation, the death of ecosystems from fertilizer use, and the loss of genetic diversity.[210] As previously noted, public investment in agriculture produces high and

206. Clive James, WBG, *Agricultural Research and Development: The Needs for Public-Private Sector Partnerships*, (No. 17693 IAG 9 Dec. 1996), http://documents.worldbank.org/curated/en/136231468739281749/Agricultural-research-and-development-the-needs-for-public-private-sector-partnerships.

207. *Id.* at 38.

208. Marco Ferroni & Paul Castle, *Public-Private Partnerships and Sustainable Agricultural Development*, 3 SUSTAINABILITY 1064 (2011), https://www.researchgate.net/publication/227439295_Public-Private_Partnerships_and_Sustainable_Agricultural_Development.

209. Mogues et al., *supra* note 118.

210. Paul Krugman, *Markets Can Be Very, Very Wrong*, N.Y. TIMES (Sept. 30, 2011), https://krugman.blogs.nytimes.com/2011/09/30/markets-can-be-very-very-wrong/.

equitable rates of return, including in ways that are not quantified economically. When the public invests in agriculture and R&D, the fruits of that investment are more likely to remain public.[211] In contrast, investments by the private sector often result in technologies that are exclusionary and/or patented, requiring small-scale farmers to either pay for the technology or find themselves crowded out due to a lack of choice in inputs.[212]

The increasing market-orientation of the production and exchange of agricultural goods during the 1980s and 1990s correlated with an emerging idea that trade and markets were the best means of achieving food security.[213] The food crises of 2007 to 2008 opened up a debate about the role of markets and provided an opportunity to more closely explore the balance between market mechanisms and government action.[214] These crises focused new attention on the need for public sector investment, the importance of small-scale producers, and sustainable production versus high-input agriculture.[215] The debate does not appear to have resulted in a significant shift away from the market-based approach.

Furthermore, the roles, relationship, and boundaries between the private and public sector in providing food security have not been thoroughly explored and remain poorly understood. The issue is not about industry and markets versus the public sector. Since the 1980s, the narrative has pitted the two against each other when, in fact, they should be essential allies.[216] The market is, after all, a creation of government. The issue is determining the appropriate roles and boundaries of each. The market and industry may provide some tools to achieve the objectives of food security, but they cannot by themselves fully satisfy the objectives related to food security and poverty alleviation. Industry is interested in markets, and in the market, demand correlates with an ability to pay rather than to human need. Unless connected to potential impact on profits, and absent law and regulation, markets also do not consider issues like inequality or justice. It is government's essential

211. Mogues, et al., *supra* note 118.

212. *Id.* at 64.

213. Susan Bragdon, *Reinvigorating the Public Sector: The Case for Food Security, Small-Scale Farmers, Trade and Intellectual Property Rules*, INT'L INST. SOC. STUD. (Feb. 4, 2016), https://www.tni.org/files/publication-downloads/64-icas_cp_bragdon.pdf.

214. Wise & Murphy, *supra* note 41.

215. *Id.*

216. PAUL PIERSON & JACOB S. HACKER, AMERICAN AMNESIA: HOW THE WAR ON GOVERNMENT LED US TO FORGET WHAT MADE AMERICA PROSPER (2016).

role to support the sustainable production of public goods and to protect the public interest and human rights.

D. *Innovative Financing Mechanisms are Needed*

The health, environmental, social, and economic costs of the current system do not seem to have been factored in when discussions about financing alternative approaches are raised. If one factors in the health, economic, social, and environmental costs of the modern agricultural system, the benefits of a transition to an agro-ecological system would seem likely to benefit most private sector actors, including farmers, as well as the planet as a whole.

In 2016, the global food and agricultural industry was about an $8 trillion market annually.[217] Assessments of the true global cost of food conducted by Trucost environmental consultants for FAO in 2015 estimate annual environmental costs at over $2.3 billion.[218] The social costs are estimated to be even higher, at $2.7 trillion.[219] Together, this adds up to a total of externalized costs of food production amounting to $5 trillion every year.[220] And this is to produce (mostly) unhealthy food to feed 30% of humanity.[221] With "true cost" or "full cost" accounting, our current industrial food system is a pricey $12.8 trillion annually.[222] Imagine what could be done with some reallocation.

Bold, transformative change begins with inclusive, open, transparent conversations with policymakers, nationally and internationally, about

---

217. *Plunkett's Food Industry Market Research: Food, Beverage and Grocery Overview*, PLUNKETT RES., https://www.plunkettresearch.com/industries/food-beverage-grocery-market-research/ (last visited Oct. 1, 2018).

218. FAO, Natural Capital Impacts in Agriculture, http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Natural_Capital_Impacts_in_Agriculture_final.pdf (June 2015).

219. *Where Does the Number of USD $4.8 Trillion of Externalized Costs per Year Come From?*, NATURE & MORE, https://www.natureandmore.com/en/true-cost-of-food/where-does-the-number-of-usd-48-trillion-of-externalised-costs-per-year-come-from (lasted visited Jan. 8, 2019).

220. *Id.*

221. THE ETC GRP., *supra* note 46, at 13; Anand Grover (Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health), Unhealthy Foods, Non-Communicable Diseases and the Right to Health, UN Doc. A/HRC/26/31 (Apr. 1, 2014); Philip J. Cafaro et al., *American Food Overconsumption, Obesity and Biodiversity Loss*, 19 J. AGRIC. & ENVIR. ETHICS 542 (2006); JEAN C. BUZBY ET AL., U.S. DEP'T OF AGRIC., EIB-121, THE ESTIMATED AMOUNT, VALUE, AND CALORIES OF POSTHARVEST FOOD LOSSES AT THE RETAIL AND CONSUMER LEVELS IN THE UNITED STATES 18 (Feb. 2014).

222. Global military expenditure in 2016 was $1.69 trillion. Press Release, Stockholm Int'l Peace Research Institute, Global Military Spending Remains High at $1.7 Trillion (May 2, 2018), https://www.sipri.org/media/press-release/2018/global-military-spending-remains-high-17-trillion.

what public monies subsidize in food systems, the costs to human health and safety, and the damage to the environment, including ecosystem services and resilience. Why are innovative financing mechanisms the solution if we are subsidizing the production of unhealthy food, feed stock to encourage excess meat production and consumption, and biofuels to power our planes, trains, and automobiles, especially considering that taxes are paying for ever-increasing, chronic, and debilitating health care costs for diet-related diseases and for other medicalized treatment of food-related illness?

In the context of the SDGs, these four assumptions must be critically evaluated before PPPs in agriculture can achieve success in the work they are being asked to do. We argue in this Paper that the "P" in PPP that stands for private sector must be centered on small-scale farmers. And the "P" in PPP that stands for the public sector or government must protect the public interest where it is at risk from large scale agribusiness. The overarching question posed by sustainable development is what enables people to eat and care for the earth simultaneously? An agro-ecological approach to partnerships—where small-scale farmers and agricultural biodiversity are central to sustainable development—is consistent with the overall SDG approach. It has a relational framing and accounts for the social, economic, and environmental effects of economic activity. It recognizes the need to balance power relations between and among multiple stakeholders. And it will be more likely to result in successful, transformational efforts to end hunger, improve nutrition and food security, and contribute to sustainable agriculture, pursuant to SDG 2.

Sustainable Development Goals Related to Small-Scale Farmers and Agrobiodiversity		
Goal	**Relevant Targets and Indicators**	**Potential Impact of Private-Sector Partnerships, Small-Scale Farmers, Food Security, and Agrobiodiversity**
SDG 1: End Poverty in all its forms everywhere	1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day. 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services, including microfinance.	• Small-Scale farmers make up a large proportion of the world's poor and hungry, despite producing more than 70% of the world's food, and are primary actors in conserving agrobiodiversity.[223] • Public-private partnerships may lead to increasing costs for small-scale farming inputs, expropriation of small-scale farmers from their land, or lower prices for their goods on the world market if they shift to exports—threatening both their livelihoods and the global supply of agrobiodiversity.[224]
SDG 2: Zero Hunger	2.1 By 2030, end hunger and ensure access by all people—in particular, the poor and people in vulnerable situations, including infants—to safe, nutritious and sufficient food all year round.	• A greater focus on export-oriented crops may decrease dietary diversity, and hence the nutritional status of the producers, particularly if the exports are non-food crops.

223. Leah H. Story et al., *supra* note 65; UTVIKLINGSFONDET, *supra* note 65.
224. *See supra*, notes 127-172 and accompanying text.

CONTINUED

Sustainable Development Goals Related to Small-Scale Farmers and Agrobiodiversity		
Goal	**Relevant Targets and Indicators**	**Potential Impact of Private-Sector Partnerships, Small-Scale Farmers, Food Security, and Agrobiodiversity**
	2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers—in particular women, indigenous peoples, family farmers, pastoralists and fishers—including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition, and non-farm employment.	• Genetically diverse plant species that small-scale farmers cultivate contain important genetic material for different environments and diseases, increasing the resilience of the global food supply. If small-scale farmers lose their ability to save and plant these varieties because of intellectual property rules and patents of private mega-businesses, the food system will become dramatically less diverse.
	2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants, and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional, and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.	
SDG 3: Good Health and Wellbeing	3.2 By 2030, end preventable deaths of newborns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as twelve per 1,000 live births and under-five mortality to at least as low as twenty-five per 1,000 live births.	• Dietary diversity and access to healthy foods, including locally-produced fruits and vegetables, is critically important for improving nutrition and preventing

	3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being. 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination.	diet-related non-communicable diseases such as diabetes and cardiovascular disease. • Partnering with large-scale agribusinesses increases their influence on global agro-food supply chains, distancing people from locally-produced sources of food and increasing the amount of processed foods in global diets. • Focusing on export production erodes the wild and domesticated biological diversity relied upon by billions of people for health and nutrition.
SDG 5: Gender Equality	5.A. Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance, and natural resources, in accordance with national laws. 5.A.1. (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure.	• Women small-scale farmers often have more tenuous access to agricultural land and resources, which may result in increased vulnerability to large-scale land acquisitions by mega agribusinesses partnering with the public sector. • The displacement of women producers also has an impact on the nutritional status of the household.
SDG 8: Decent Work for All	8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7% GDP growth per annum in the LDCs. 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation,	• Public-private partnerships for economic growth in developing countries with large-scale agribusinesses may lead to these countries orienting their agricultural sectors towards exporting in a global market.

CONTINUED

Sustainable Development Goals Related to Small-Scale Farmers and Agrobiodiversity		
Goal	**Relevant Targets and Indicators**	**Potential Impact of Private-Sector Partnerships, Small-Scale Farmers, Food Security, and Agrobiodiversity**
	including through a focus on high-value added and labor-intensive sectors. 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity, and innovation, and encourage the formalization and growth of micro-, small-, and medium-sized enterprises.	• Without complementary measures, this could decrease dietary diversity and the nutritional status of producers, particularly if they are exporting non-food crops. • Could erode agricultural diversity, reducing resiliency and threatening the foundation for the ability to adapt to climate change and other stressors.
SDG 13: Climate Action	13.2 Integrate climate change measures into national policies, strategies, and planning.	• Industrial agricultural methods practiced by large-scale agribusinesses are responsible for the erosion of agricultural biodiversity, reducing resiliency and threatens the foundation for the ability to adapt climate change and other stressors.
	13.B. Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states, including focusing on women, youth, and local and marginalized communities.	
SDG 15: Life on Land	15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and,	• Global intellectual property rules and trade agreements, such as the UPOV 1991, contain clauses that prevent small-scale farmers from engaging in

	by 2020, protect and prevent the extinction of threatened species.	biodiversity-conserving practices such as seed-saving —which may lead to greater use of industrial pesticides and fertilizers that may be damaging to ecosystems. • Private firms have a vested interest in upholding these intellectual property rules, as they are most commonly the patent holders for these genetic technologies and agricultural inputs.
	15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.	
	15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies, and accounts.	
	15.A. Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.	
SDG 16: Peaceful and	16.6 Develop effective, accountable, and transparent institutions at all levels. 16.7 Ensure responsive, inclusive, participatory, and	• Since 2008, rapid increases in the global prices for major grains helped to trigger outbreaks of civil unrest in more than forty countries.[225]

225. Emmy Simmons, *Harvesting Peace: Food Security, Conflict, and Cooperation*, 14 ENVTL. CHANGE & SEC. PROG. REP. 3 (2013).

CONTINUED

Sustainable Development Goals Related to Small-Scale Farmers and Agrobiodiversity		
Goal	**Relevant Targets and Indicators**	**Potential Impact of Private-Sector Partnerships, Small-Scale Farmers, Food Security, and Agrobiodiversity**
Inclusive Societies	representative decision-making at all levels. 16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance. 16.10 Ensure public access to information . . . in accordance with national legislation and international agreements. 16.B Promote and enforce non-discriminatory laws and policies for sustainable development.	• Focus on export-oriented agricultural methods aimed at connecting small-scale farmers to world markets is linked to food price instability.[226] • Conflicts mainly affect rural populations, having a huge impact on food and agricultural production and smallholder livelihoods.[227] • Social, political, or economic inequities that affect people's food security can exacerbate grievances and build momentum towards conflict.[228] • Agricultural biodiversity is a critical component of a resilient, sustainable food system, and informal seed

226. *See supra* note 39 and accompanying text.

227. *See* Josefina Stubbs, Opinion, *Harvesting Peace: How Rural Development Works for Conflict Prevention*, INTER PRESS SERVICE (Jan. 23, 2017), http://www.ipsnews.net/2017/01/harvesting-peace-how-rural-development-works-for-conflict-prevention/.

228. *See* Cullen Hendrix & Henk-Jan Brinkman, *Food Insecurity and Conflict Dynamics: Causal Linkages and Complex Feedbacks*, 2 STABILITY: INT'L J. SEC. & DEV. 26 (2013).

		systems provide social cohesion, an important ingredient for peaceful and inclusive societies.
SDG 17: Partnership for the Goals	17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology, and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.	• The promotion of public-private partnerships for the financing of the sustainable development goals relies on a tenuous history of such partnerships in past development efforts (starting in U.N. Conference on Environment and Development of 1992). • Past experiences of PPPs in agricultural sectors has seen a decline in public-spending on agricultural research and development (which keeps innovations accessible in the public sphere); the expropriation of small-scale farmers from their land to transfer it to private investors; and the restriction of small-scale farmers' ability to engage in biodiversity-conserving practice due to global intellectual property rules and monopolized input markets.
	17.17 Encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships.	