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Successful Agricultural Transformation: Selected Challenges in the Emerging Global Environment

By Isabelle Tsakok

Summary

Low-productivity, subsistence-smallholder agriculture everywhere faces tremendous new challenges, in addition to decades-old constraints. Smallholders are threatened by being bypassed by the rise and dominance of domestic and global value chains (DVCs, GVCs). They are also being threatened by global warming, which is already rewriting the basic parameters of temperature and precipitation on which their entire activities depend. These global forces are much too powerful for any farming or livestock enterprise, no matter how rich, to adjust to and thrive without assistance. For subsistence smallholders adjustment is particularly hard.

"We are clearly the last generation that can change the course of climate change, but we are also the first generation with its consequences," said Kristalina Georgieva, World Bank CEO until September 2019[1]. It is also clear that this is the last generation of governments that can do something to radically improve the condition of smallholders, thus averting the looming disaster millions of smallholders face.

This is a call to action. Given these powerful forces—globalization through global and domestic value chains, and climate change—steps must be taken on at least two fronts. First, farmers must be equipped with timely information, basic infrastructure (e.g. transport, marketing, communications and water control), and channels for aggregation so they can be integrated into value chains and can access lucrative markets. Second, smallholders should share the advantages successful farmers worldwide enjoy: assistance in terms of agricultural research and extension services, meteorological and early warning systems, and access to land with tenure security, including enforceable titles.

None of the above measures are new. They have been shown to bear fruit time and again—to the benefit of farmers, consumers and the entire economy. However, too many governments remain uncommitted. Action on a broad front is now urgent. Time may be running out.

1. Georgieva was speaking in December 2018; see https://www.theguardian.com/environment/2018/dec/03/we-are-last-generation-that-can-stop-climate-change-un-summit.

Introduction

"No country has succeeded in its industrial revolution without a prior (or at least simultaneous) agricultural revolution. Neglecting agriculture in the early stages of development in neglecting development" (Timmer, 2015: 4)[2].

Timmer's insight has been vindicated time and again by the developing world, which is still mired in the chronic poverty widespread in subsistence agriculture. Ever since Schultz (1964)[3], transforming subsistence agriculture has been widely considered pivotal to sustained development. There is also an extensive literature on what has worked, from which governments can draw. In fact, a distinct pattern can be seen in countries that have successfully transformed their agricultural economies and have thus enabled their entire economies to grow, develop, and industrialize.

Decades of investment in public goods and services are required to create five conditions which exist in all cases of successful transformation. These conditions were discussed in a series of five Policy Briefs, published from July 6, 2018 to October 18, 2018 by the OCP Policy Center (now the Policy Center for New South), and have been analyzed in a monograph entitled: ***Successful Agricultural Transformation: Five Key Conditions.*** This Policy Brief accompanies the monograph.

The five conditions are[4]:

- A stable framework of macroeconomic and political stability. Central and local governments are able to enforce peace and order.
- An effective technology-transfer system. Research and extension messages reach the majority of farmers.
- Access to lucrative markets. The majority of farmers enjoy expanding markets of paying customers. To them, investing in agricultural and rural production is good business.
- An ownership system including a system of usufruct rights that rewards individual initiative and toil. It is feasible for farm/rural families to gain financially from risk-taking and hard work.
- Employment-creating non-agricultural sectors. As agriculture becomes more productive, it must shed labor, which unless absorbed by non-farm jobs that pay as well as agriculture, would simply constitute exporting of farm poverty to other sectors.

While these may seem obvious, what is not obvious is how only a minority of governments have been able to maintain these conditions over decades.

This Policy Brief places national efforts at agricultural transformation within the global context of selected developments in the coming decades. These developments represent both opportunities and constraints for each country. They are:

- Value Chains—global and domestic—their rise and why they matter for agricultural transformation;
- Climate change—predicted increase in frequency and severity of extreme weather events and implications for agricultural transformation.

This Policy Brief first discusses global and domestic value chains (GVCs/DVCs), then climate change, with focus on the environment that each factor creates, and what opportunities and constraints they present for successful agricultural transformation.

Section I: Global and Domestic Value Chains—Their rise and why they matter

The rise of global value chains (GVC, 1990-2008) and why they matter

Brief background: Raw materials and luxury goods have been traded internationally for centuries. Over the centuries, globalization has ebbed and flowed. The first wave of globalization, dated 1870-1914, has been attributed to the steamship. During this period, Great Britain ruled "an empire on which the sun never sets". The

2. Timmer, C. Peter. 2015. Food Security and Scarcity: Why Ending Hunger Is So Hard. The Center for Global Development. The University of Pennsylvania Press, Philadelphia.

3. Schultz, Theodore W. 1964. Transforming Traditional Agriculture. New Haven, CT: Yale University

4. They are discussed at length in Tsakok, Isabelle. 2011. Success in Agricultural Transformation: What it means and What makes it happen. (Cambridge University Press).

second wave of globalization is dated 1945-89, during which the United States and the Soviet Union battled over world domination—the period of the Cold War. The major trading nations then were the United States and countries of the European Union. The third wave is dated from 1989/1990 through to the global financial crisis of 2007/2008. This period witnessed momentous political-economic events, including the fall of the Berlin Wall (Nov. 9, 1989), after which Eastern Europe embarked on its integration with Western Europe and the world, the Soviet Union disintegrated (Dec. 25, 1991), and even Communist China joined the World Trade Organization (WTO) on Dec. 11, 2001. Dynamic growth of GVC has stagnated since 2008 with the rise of protectionism, among other things. The fourth wave of globalization is still being shaped, driven by digitalization in goods and services (World Economic Forum, Jan. 2019)[5].

Key contributing factors to the rise of GVCs: As the brief history above shows, there is a close interaction between waves of globalization, and major political-economy events. Other contributing factors are technological advances and policy reforms, especially with respect to international trade. These additional forces shaped the third wave, during which global value chains (GVC) became a major force deepening the integration of economies. There were key technological advances in information, communications and transport, and a lowering of trade barriers, factors that jointly provided a conducive global environment for the globalization of manufactures and services.

The expansion of global trade through GVCs: Within this favorable environment, trade (the sum of exports plus imports) rose to half of global GDP (World Economic Forum, Jan. 2019), generating substantial and poverty-reducing income growth. The growth in GVCs has been concentrated in machinery, electronics, and transportation. The regions specializing in these sectors are in East Asia, North America, and Western Europe, where advanced manufacturing and services, and innovative activities are also concentrated. All countries participate in GVC expansion, but not at the same level of sophistication (WDR, 2020: 2, Map O.1)[6]. There are two distinctive features of GVCs. First, the highly developed division of labor in GVCs means production processes can be broken up and distributed across countries. Firms might specialize in only a specific task in the entire production chain, instead of producing the whole product; a bicycle can be the product of eight countries, for example. The trade in bicycle parts has outstripped the trade in bicycles by 15%-25% in recent years (WDR 2020: 17). Second, GVCs are built on long-term supply-buyer relationships among firms along a chain, referred to as relational contracting or 'sticky' buyer-seller relationships. Thus, a firm producing only a part of a complex machine cannot suddenly switch its suppliers, irrespective of the quality standard that has been agreed and that must be maintained throughout the whole chain. Because of this 'stickiness', a stable political, legal, and policy environment is essential for GVCs to form and thrive.

The share of agriculture and agri-food in GVCs is small, but in DVCs is increasing: The agriculture and agri-food sector has also been drawn into GVC expansion, but it remains a small part of GVC trade, even during its phase of dynamic growth. In 2014, agriculture accounted for only 2% of world trade, whereas manufactures and services accounted for 60% and 20% respectively (WDR, 2020: 27-28). For the agri-food sector, domestic value chains (DVCs) are more important than GVCs. For decades, in region after region, the 'supermarket revolution' has been unfolding, driven in earlier years by profound socio-economic changes, namely increased urban demand from higher-income and quality-conscious consumers who are able to afford more diversified diets. This revolution has been transforming the agri-food sector in developing countries and impacting small farmers. The transformation has been driven by private investment—foreign and domestic—spurred on by an enabling policy environment of trade liberalization and liberalization of FDI in the food industry (Reardon and Timmer: 2007)[7]. This transformation also proceeded in waves: the first wave from the early 1990s in Latin America and Central Europe; and the second wave from the mid-1990s in Southeast Asia (excluding Vietnam), Central America and Mexico. By the late 1990s and the 2000s, the third wave had reached China, India, Vietnam, Russia, and Africa (outside South Africa), mainly eastern and southern Africa. Over time, the customer base has expanded from large urban to mid-

5. World Economic Forum. Peter Vanham. Jan 17, 2019. "A Brief History of Globalization". (Accessed April 1, 2020) https://www.weforum.org/agenda/2019/01/how-globalization-4-0-fits-into-the-history-of-globalization/

6. World Development Report. 2020. Trading for Development in the Age of Global Value Chains. World Bank Group Flagship Report. https://openknowledge.worldbank.org/handle/10986/32437

7. Reardon, T., & Timmer, C. P. (2007). Transformation of markets for agricultural output in developing countries since 1950: How has thinking changed? In R. E. Evenson & P. Pingali (Eds.). Handbook of agricultural economics (Vol. 3, pp. 2808–2855). Amsterdam: Elsevier Press.

size towns and to rural areas, and from more affluent to less affluent and poorer households. The supermarkets have expanded their ranges of goods from processed to semi-processed and to fresh produce, especially in East Asia (Reardon, Timmer and Minten, 2012)[8]. These successive developments have completely changed the nature of wholesale and retail trade and their methods of procurement. Therefore, to thrive, smallholders must find ways of integrating themselves into these supply or value chains, domestic and/or global.

Implications for promoting higher productivity growth and profitability of smallholder agriculture: Provision of public goods and services

Condition on market access: Since, "the rise of GVCs has generated even greater income gains than a commensurate expansion of traditional trade" (WDR, 2020: 68), it is the distribution of the gains that is problematic. Millions of smallholders are being bypassed. Companies in value chains find that many smallholders are simply too expensive to reach. Smallholders do not offer the scale, reliability (or consistency), or quality of supply needed, and lack the capability to obtain relational contracts downstream along the chain. Reaching smallholders remains problematic despite government investment in public infrastructure and in establishing conducive environments to attract private business, domestic and foreign. Specifically, investments undertaken at different levels include:

- **Wholesale level:** In Latin America, governments invested in public wholesale markets in the 1970s-1980s. They also invested in the dissemination of public market information. In the 1990s-2000s, wholesale markets were upgraded and deregulated in India, to spur greater entry and competition. In China and Indonesia, in the 2000s, rural and urban wholesale markets for fresh produce were consolidated, with specialized and dedicated wholesale buyers becoming key purchasing agents. Multinationals also entered markets in developing countries, either competing with or partnering with local business (Reardon et al, 2009: 1717-18)[9].

- **Processing level:** In the 1970s-1980s, there was a concentration of market and sales power as large parastatal agro-processors emerged in most developing countries. But they were not alone: there were also private sector corporations in grain and meat, and export crops. In the 1980s-1990s, there was a proliferation of small and medium enterprises (SMEs) with rapid product differentiation as the consumer base expanded, and women increased their participation in the formal labor market. In the 1990s-2000s, there was a reconsolidation of enterprises, e.g. in sugar, dairy, and general food processing.

- **Retail level:** In the 1970s-1980s, there was an expansion of state subsidized ration shops in India, and state-run retail chains in China and the Soviet Union/Russia. The 1990s-2000s saw a massive expansion throughout developing Asia of supermarkets and fast-food chains driven by large influxes of FDI spurred by the liberalization of the retail sector.

Given these infrastructural changes in marketing along the value chain, the dispersed nature of smallholders is a major impediment to their integration in value chains, unless they have the following advantages: (i) non-land assets such as irrigation, easy access to transport (e.g., all weather roads), and reliable communications, and on-farm capital equipment for safe storage such as on-farm cooling tanks for milk; (ii) aggregation though various forms of producer and/or marketing cooperatives; and (iii) use of mechanisms for contract enforcement. Fortunately, these advantages are primarily of a public goods and services nature. Therefore, it is the rightful role of governments to invest in them to give smallholders these advantages.

Climate change: Global warming and the threat of increased frequency and severity of extreme climate events

8. Reardon, Tom, C. Peter Timmer, and Bart Minten. July 31, 2012. "Supermarket revolution in Asia and emerging development strategies to include small farmers". Proceedings of the National Academy of the Social Sciences.
https://www.pnas.org/content/109/31/12332.long

9. Reardon, Thomas, Christopher B. Barrett, Julio A. Berdegué, and Johan F.M. Swinnen. 2009. " Agrifood Industry Transformation in Small farmers in Developing Countries." in World Development, Vol. 37, # 11: 1717-1727.

Global warming an existential threat and slowing it a daunting challenge: The year 2019 was likely the second warmest year on record (WMO, 2020: 6)[10]. As predicted, there has already been an increased frequency and severity of extreme climatic events including catastrophic droughts, floods, wild fires, and cyclones/typhoons, causing widespread damage, including loss of life. According to the 2018 IPCC report, the global temperature has risen by 1 degree Celsius since the 1850-1900 baseline, and is on a trajectory to increase by 4 degrees Celsius if the global community follows a business-as-usual path (IPCC Special Report 2018)[11]. The report issued a "final call" for the world community to limit the temperature rise to 1.5ºC. If the world community can achieve this scenario, the reduction of people exposed to climate-related risks and to poverty would be in the several hundred millions. This would be a major achievement, but will require a 45% reduction in carbon emissions between 2010 and 2030. This will require "rapid, far reaching and unprecedented changes in all aspects of society" (IPCC Special Report 2018). This is a daunting challenge indeed.

Predicted changes in precipitation and temperature impacting on broad agricultural variables: Predicted changes will impact the global distribution of agro-ecological zones, changing soil moisture and content, and lengthening/shortening growing seasons. These profound changes will tend to benefit countries in middle and higher latitudes—e.g., northern China, and many parts of northern Europe and America—as rising temperatures will lengthen their growing seasons and expand their crop-producing areas. Thus, for every 1ºC rise in temperature, the United States corn belt would shift northeast. Canada's winter wheat production would increase. (Kurukulasuriya and Rosenthal, 2003: 11-12)[12]. However countries in lower latitudes—including tropical areas where agriculture's share in GDP is large and poverty is extensive—are likely to be negatively impacted by these rising temperatures. The lowlands in tropical areas, especially semi-arid areas, will be adversely impacted, while the highlands are likely to benefit. The models cannot predict the actual impact of global warming on any specific area or zone, for actual climate change impacts depend on many local environmental and farm-management factors. Therefore, to assist any particular group of stakeholders, more detailed and up-to-date analyses need to be undertaken and disseminated in a timely fashion.

Possible impact on agricultural productivity and production in agriculture and agri-food: The climate change impact will depend on several variables, including:

- Whether the global community is able to mitigate the temperature rise and limit it to 1.5ºC. For this to happen, the IPCC 2018 report estimated that 2.5% of global GDP will have to be invested for two decades in mitigation methods;
- Topography and amount of precipitation. For example, the cool and humid highlands of Kenya would benefit from increased concentrations of carbon dioxide if accompanied by increased precipitation, otherwise the higher rates of evapotranspiration would be detrimental. However the low-lying areas of eastern and southern Kenya, particularly those that are semi-arid, would suffer;
- Climate variability in general and shifts in the pattern and amount of rainfall in particular. Thus, a decrease in rain in August—the critical reproductive stage for millet in Niger—would not only hurt millet production but would cause farmers not to plant their main cash crop, peanuts;
- Increased drought; e.g., that would change forest cover by type and coverage. For example, increased drought in the forest areas of Zimbabwe would change one fifth of total land area from sub-tropical thorn woodland to sub-tropical dry forest and to very dry forest;
- The uptake of adaptation techniques/measures by policymakers and farmers. Skillful and timely adaptation has the potential to reduce the negative impact of climate change and to increase yields and resilience.

10. World Meteorological Organization. 2020. WMO Statement on the State of Global Climate in 2019. WMO-No. 1248 https://library.wmo.int/doc_num.php?explnum_id=10211

11. IPCC Global Warming Special Report. 2018. What does it actually mean? IPCC stands for Intergovernmental Panel on Climate Change, created in 1988. https://www.coolearth.org/2018/10/ipcc-report-2/?gclid=CjwKCAjw4KDOBRBUEiwA7MFNTbHMEHyOnU2Co6GpR9xgtOupcAOeY6LlDFeET_IO6TnV7ypKAAoY5BoCciYQAvD_BwE

12. Kurukulasuriya, Pradeep and Shane Rosenthal. JN 2003. Climate Change and Agriculture: A Review of Impacts and Adaptations. World Bank. Climate Change Series. Paper # 91. Report # 78739 https://openknowledge.worldbank.org/bitstream/handle/10986/16616/787390WPOClimaOure0377348BOOPUBLIC0.pdf?sequence=1&isAllowed=y

Climate change an existential threat unless millions of smallholders are able to adapt: If there were ever a challenge for which smallholders need assistance, it is responding adequately to climate change. Millions of smallholders still primarily mired in low-productivity subsistence agriculture have not been reached by any system of technology transfer (condition 2 above), while remaining disadvantaged by lack of connectivity to lucrative markets that value chains serve (condition 3 above). Millions of smallholders in sub-Saharan Africa are further disadvantaged by their lack of access to clear, enforceable titles to the land they till. Furthermore, *"... despite its abundant agricultural land and natural resources, Sub-Saharan Africa is still mostly poor and has been unable to translate its recent robust growth into rapid poverty reduction. These examples suggest that poor land governance—the manner in which land rights are defined and administered—may be the root of the problem... only 10 percent of Africa's rural land is registered. The remaining 90 percent is undocumented and informally administered, which makes it susceptible to land grabbing, expropriation without fair compensation, and corruption"* (Byamugisha, 2013: 1, xvi-xvii)[13]. Unfortunately, the problems of inadequate access to land and of land tenure insecurity are not limited to sub-Saharan Africa. Millions of smallholders in Asia also do not enjoy condition 4 on land rights and tenure security—India, Indonesia, and the Philippines are still burdened with this dual problem (despite the fact that India and the Philippines undertook land reform). In all cases where agriculture has been successfully transformed, farmers have been assisted for decades—their governments have assisted them with technology transfer, market access, land access and tenure security, among other things (Tsakok, 2011)[14]. Instead of support, millions of smallholders have actually been taxed, directly and indirectly (Krueger et al, 1991)[15] (Anderson et al, 2008)[16]. It is therefore unsurprising that they have not been able to achieve and sustain high productivity growth and good incomes. Even after the sector-specific and economy-wide disincentives were removed or reduced (around the mid-1990s), millions of smallholders were left without assistance or guidance on best agricultural techniques, the security of their asset base (land), lucrative market access, and climate change threats to their livelihoods.

Conclusion

Nearly 75 years after the end of the devastating Second World War, many countries have successfully transformed their agricultural economies and thereby their entire economies. However, many more are still mired in the severe poverty prevalent in low-productivity subsistence agriculture. Yet there is an extensive body of experience and literature for governments, farmers, and development practitioners to draw on for achieving successful transformation. Taking the first step is the key thing for "a journey of a thousand miles starts with the first step" (Lao Tzu, 6th century BCE).

13. Byamugisha, Frank F.K. 2013. Securing Africa's Land for Shared Prosperity: A Program to Scale up Reforms and Investments. The World Bank and Agence Française de Développement . http://documents.worldbank.org/curated/en/732661468191967924/pdf/Securing-Africas-land-for-shared-prosperity-a-program-to-scale-up-reforms-and-investments.pdf

14. Tsakok, Isabelle. 2011. Success in Agricultural Transformation: What it means and What makes it happen. (Cambridge University Press).

15. Krueger, Anne O, Maurice Schiff, and Alberto Valdes. (Eds.) 1991 The Political Economy of Agricultural Pricing Policy. 3 Vols. A World Bank Comparative Study. Baltimore: Johns Hopkins University Press for the World Bank.

16. Anderson, Kym, Marianne Kurzweil, Will Martin, Damiano Sandri, Ernesto Valenzuela. 2008. Measuring Distortions to Agricultural Incentives Revisited. World Bank. WPS # 4612. https://openknowledge.worldbank.org/bitstream/handle/10986/6711/wps4612.pdf?sequence=1&isAllowed=y

About the author, Isabelle Tsakok

Isabelle Tsakok is an adjunct professor at SIPA and a Senior Fellow at the Policy Center for the New South, previously known as OCP Policy Center, who focuses on rural development, agricultural economics, policy analysis, food security and poverty reduction. She holds a PhD in Economics. Dr. Tsakok has worked on development issues for over twenty-five years, first as World Bank staff and since retirement as a consultant. She has specialized in policy analysis, program and project formulation and evaluation, research and training activities in agriculture, agro-business, rural development and poverty reduction. She has worked in most regions of the developing world: Africa, Asia - South, Southeast and East, North Africa and the Middle East and Latin America.

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Policy Center for the New South

Suncity Complex, Building C, Av. Addolb, Albortokal Street,
Hay Riad, Rabat, Maroc.
Email : contact@policycenter.ma
Phone : +212 (0) 537 54 04 04 / Fax : +212 (0) 537 71 31 54
Website : www.policycenter.ma