

References

- Abu Hatab A, Cavinato MER, Lindemer A and Lagerkvist C-J (2019). Urban sprawl, food security and agricultural systems in developing countries: A systematic review of the literature. *Cities*. 94129–142.
- AfDB (2020). African Development Bank launches record breaking \$3 billion "Fight COVID-19" Social Bond. Available at https://www.afdb.org/en/news-andevents/press-releases/african-development-banklaunches-record-breaking-3-billion-fight-covid-19social-bond-34982 (accessed 17 July 2020).
- AfterAccess (2018). Understanding the gender gap in the Global South. DIRSI, LIRNEasia, Research ICT Africa. AfterAccess.
- AGOA info (2018). Presidential Proclamation regarding Rwanda's AGOA eligibility. Available at https://agoa. info/news/article/15493-presidential-proclamationregarding-rwanda.html (accessed 22 July 2020).
- Agricultural Transformation Consultation Team (2019). APO Agricultural Transformation Framework. Asian Productivity Organization. Tokyo. (accessed 9 June 2020).
- Akileswaran K and Hutchinson G (2019). Adapting to the 4IR: Africa's development in the age of automation. Tony Blair Institute for Global Change. London. (accessed 29 April 2020).
- Akter S et al. (2017). Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy*. 69270–279.
- Ali D, Bowen DE, Deininger K and Duponchel M (2016). Investigating the gender gap in agriculture productivity: Evidence from Uganda. *World Development*. 87152–170.
- Allen DT (2019). Farmers are using Al to spot pests and catch diseases. Business Insider. Available at https://www.businessinsider.com/farmersartificial-intelligence-in-agriculture-catch-diseasepests?r=US&IR=T (accessed 10 June 2020).
- AMFG (2019). AM Around the World: How Mature is 3D Printing in the Asia-Pacific Region? Available at https://amfg.ai/2019/11/20/am-around-the-worldhow-mature-is-3d-printing-in-the-asia-pacificregion/ (accessed 27 August 2020).
- Aminetzah D, Katz J and Mannion P (2020). How innovations in food sustainability can help feed the world responsibly. *McKinsey Quarterly*.
- Andreoni A and Anzolin G (2019). A revolution in the making? Challenges and opportunities of digital production technologies for developing countries. Working Paper No. 7/2019. UNIDO. Vienna.
- Arnaudo D (2019). Bridging the Deepest Digital Divides: A History and Survey of Digital Media in Myanmar. In: Punathambekar A, and Mohan S, eds. *Global*

Digital Cultures: Perspectives from South Asia. University of Michigan Press. Ann Arbor.

- Ashford LS (2007). Africa's Youthful Population: Risk or Opportunity? Available at http://www.brac.net/ sites/default/files/glm/AfricaYouth.pdf.
- AUC (2020). Africa CDC receives third donation of medical supplies from Jack Ma Foundation, cohosts global MediXChange webinar on COVID-19. Available at https://africacdc.org/news/africa-cdcreceives-third-donation-of-medical-supplies-fromjack-ma-foundation-co-hosts-global-medixchangewebinar-on-covid-19/ (accessed 17 July 2020).
- Aung LL (2020). Report on the economic, social and environmental consequences of COVID-19 on Myanmar and their implications for graduation from LDC status. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- Aung TT, Paul R and McPherson P (2020). "All my dreams are shattered": Coronavirus crushes Asia's garment industry. Reuters. Available at https://www. reuters.com/article/us-health-coronavirus-garmentidUSKBN22U34V (accessed 20 May 2020).
- Aye TM (2018). 4 Agri-Tech Game Changers That are Transforming Myanmar's Agriculture Industry. ProspectsASEAN. Available at https://www. prospectsasean.com/agri-tech-game-changerstrasforming-myanmar-agriculture-industry/ (accessed 14 July 2020).
- Bacha EL (1990). A three-gap model of foreign transfers and the GDP growth rate in developing countries. *Journal of Development Economics*. 32(2):279–296.
- Bah EM (2011). Structural Transformation Paths Across Countries. *Emerging Markets Finance & Trade*. 475–19.
- Baker L and Sovacool BK (2017). The political economy of technological capabilities and global production networks in South Africa's wind and solar photovoltaic (PV) industries. *Political Geography*. 601–12.
- Baldwin R (2016). *The great convergence: Information technology and the new globalization*. Belknap Press. Cambridge (MA).
- Baldwin R and Evenett S, eds. (2020). COVID-19 and Trade Policy: Why Turning Inward Won't Work. Centre for Economic Policy Research (CEPR). London.
- Baldwin R and Robert-Nicoud F (2014). Trade-in-goods and trade-in-tasks: An integrating framework. *Journal of International Economics*. 92(1):51–62.
- Baldwin R and Weder di Mauro B, eds. (2020a). *Mitigating the COVID Economic Crisis: Act Fast and Do Whatever It Takes*. Centre for Economic Policy Research (CEPR). London.
- Baldwin R and Weder di Mauro B, eds. (2020b). Economics in the Time of COVID-19: A New EBook.

Centre for Economic Policy Research (CEPR). London.

- Banga K and te Velde DW (2018). Digitalisation and the future of manufacturing in Africa. Supporting Economic Transformation (SET). ODI. London.
- Baraniuk C (2018). The crop-spraying drones that go where tractors can't. BBC News. Available at https://www.bbc.com/news/business-45020853 (accessed 14 July 2020).
- Barefoot K, Curtis D, Jolliff W, Nicholson JR and Omohundro R (2018). Defining and Measuring the Digital Economy. Working Paper No. 2018–4. Bureau of Economic Analysis, United States Department of Commerce. Washington D.C.
- Bärenfänger R, Otto B and Gizanis D (2015). Business and Data Management Capabilities for the Digital Economy. White Paper No. V1.0. Competence Center Corporate Data Quality (CDQ AG). Geneva, Switzerland.
- Behrman J, Quisumbing A and Peterman A (2011). A Review of Empirical Evidence on Gender Differences in Non-land Agricultural Inputs, Technology, and Services in Developing Countries. ESA Working Paper No. 11–11. Food and Agriculture Organization of the United Nations.
- Bell M and Pavitt K (1993). Technological Accumulation and Industrial Growth: Contrasts Between Developed and Developing Countries. *Industrial and Corporate Change*. 2(2):157–210.
- BenYishay A, Jones M, Kondylis F and Mobarak AM (2020). Gender gaps in technology diffusion. *Journal* of *Development Economics*. 143(C):
- Bernasconi-Osterwalder N, Brewin S and Maina N (2020). Protecting Against Investor–State Claims Amidst COVID-19: A call to action for governments. International Institute for Sustainable Development. (accessed 24 July 2020).
- Beverelli C, Fiorini M and Hoekman B (2017). Services trade policy and manufacturing productivity: The role of institutions. *Journal of International Economics*. 104166–182.
- Biggs T, Shah M and Srivastava P (1995). Technological Capabilities and Learning in African Enterprises.
 World Bank Technical Paper No. 288. World Bank.
 Washington D.C.
- Bloomberg J (2018). Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril. *Forbes*. Available at https://www.forbes.com/ sites/jasonbloomberg/2018/04/29/digitizationdigitalization-and-digital-transformation-confusethem-at-your-peril/ (accessed 15 July 2020).
- *Bloomberg.com* (2020). Tech Startups Are Flooding Kenya With Apps Offering High-Interest Loans. 12 February.

- Bosio E, Jolevski F, Lemoine J and Ramalho R (2020). Survival of firms in developing economies during economic crisis. In: Djankov S, and Panizza U, eds. COVID in Developing Economies. Centre for Economic Policy Research (CEPR). London: 157–174.
- Bradley C, Hirt M, Hudson S, Northcote N and Smit S (2020). The great acceleration. Strategy & Corporate Finance Practice. McKinsey & Company .
- Bresnahan T (2010). General Purpose Technologies. In: Hall B H, and Rosenberg N, eds. *Handbook* of the Economics of Innovation. Elsevier. Amsterdam: 761–791.
- Brianna Craft, Stella Gama and Thinley Namgyel (2017). Least Developed Countries' experiences with the UNFCCC technology mechanism. IIED Issue Paper. International Institute of Environment and Development (IIED). London. (accessed 24 July 2020).
- Briguglio L, Cordina G, Farrugia N and Vella S (2008). Economic Vulnerability and Resilience: Concepts and Measurements. Research Paper No. 2008/55. United Nations University – World Institute for Development Economics Research (UNU-WIDER). Helsinki.
- Brooks DH (2007). Industrial and Competition Policy: Conflict or Complementarity? Asian Development Bank. http://hdl.handle.net/11540/4061.
- BuddeComm (2020). Myanmar begins to see increased competition in the fibre broadband Segment. GlobeNewswire. Available at http://www.globenewswire.com/newsrelease/2020/02/12/1983781/0/en/Myanmarbegins-to-see-increased-competition-in-the-fibrebroadband-Segment.html (accessed 6 July 2020).
- Bughin J, LaBerge L and Mellbye A (2017). The case for digital reinvention. *McKinsey Quarterly*.
- Cabeza Gutés M (1996). The concept of weak sustainability. *Ecological Economics*. 17(3):147–156.
- Calderón C and Servén L (2010). Infrastructure and Economic Development in Sub-Saharan Africa. *Journal of African Economies*. 19(suppl_1):i13–i87, Oxford Academic.
- Castellacci F (2011). Closing the Technology Gap? Review of Development Economics. 15(1):180–197.
- Cayeux J, Dagorn J-C and Pascal P (2017). An analysis of the challenges facing the food system in Haiti. Papaye Peasant Movement (MPP) and Action Against Hunger. New York.
- CDP (2020). Outcome of the comprehensive review of the LDC criteria. United Nations – Committee for Development Policy. New York.
- CDP and UN DESA (2018). Handbook on the Least Developed Country Category: Inclusion, Graduation

and Special Support Measures. United Nations. New York.

- CDP and UN DESA (2020). Report on the twentysecond session (24–27 February 2020) – Economic and Social Council. Nr. E/2020/33. Available at https://undocs.org/en/E/2020/33.
- Chandra A and McNamara KE (2018). Climate-Smart Agriculture in Southeast Asia. *Resilience*. Elsevier: 165–179.
- Chandran N (2019). Growing pains: Southeast Asian farmers need cheaper agritech. Aljazeera. https://www.aljazeera.com/ajimpact/growingpains-southeast-asian-farmers-cheaperagritech-191227085148352.html. (accessed 9 June 2020).
- Chang H-J and Andreoni A (2020). Industrial Policy in the 21st Century. *Development and Change*. 51(2):324–351.
- Chenery HB and Bruno M (1962). Development Alternatives in an Open Economy: The Case of Israel. *The Economic Journal*. 72(285):79–103.
- Chew R et al. (2020). Deep Neural Networks and Transfer Learning for Food Crop Identification in UAV Images. *Drones*. 4(1):7.
- Cimoli M, Dosi G and Stiglitz JE (2009). *Industrial Policy* and Development. Oxford University Press.
- Cirera X and Maloney WF (2017). The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up. World Bank. Washington (DC).
- Cohen B (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*. Sustainable Cities. 28(1):63–80.
- Crespi G, Fernandez-Arias E and Stein E, eds. (2014). Rethinking Productive Development Sound Policies and Institutions for Economic Transformation. Palgrave Macmillan. Basingstoke.
- CTA (2019). The Digitalisation of African Agriculture Report, 2018–2019. The Technical Centre for Agricultural and Rural Cooperation (CTA). AJ Wageningen.
- Day GS (2011). Closing the Marketing Capabilities Gap. *Journal of Marketing*. 75(4):183–195.
- De Clercq M, Vats A and Biel A (2018). Agriculture 4.0 – The Future of Farming Technology. The World Government Summit. Dubai, United Arab Emirates. (accessed 8 June 2020).
- Deloitte (2017). From Interpretation to prediction: Unleashing the Value of the Industrial Internet of Things. Deloitte China. Shanghai. (accessed 12 June 2020).

- Deloitte (2020). The fourth industrial revolution: At the intersection of readiness and responsibility. Deloitte Insights. (accessed 26 May 2020).
- Dennis C and Stahley K (2012). Universal Primary Education in Tanzania: The Role of School Expenses and Opportunity Costs. *Evans School Review*. 2(1).
- Devanesan J (2020). How agritech solutions are shaping Myanmar's digital economy. Tech Wire Asia. Available at https://techwireasia.com/2020/06/ how-agritech-solutions-are-shaping-myanmarsdigital-economy/ (accessed 14 July 2020).
- Development Initiatives (2020). Coronavirus and aid data: What the latest DAC data tell us. Briefing. Development Initiatives. Bristol.
- Diyamett B and Mutambla M (2014). Foreign direct investment and local technological capabilities in least developed countries: some evidence from the Tanzanian manufacturing sector. *African Journal of Science, Technology, Innovation and Development*. 6(5):401–414.
- Djankov S and Kiechel A-L (2020). The IMF and the World Bank can do more. In: Djankov S, and Panizza U, eds. *COVID in Developing Economies*. Centre for Economic Policy Research (CEPR). London: 374–385.
- Djankov S and Panizza U, eds. (2020). *COVID in Developing Economies*. Centre for Economic Policy Research (CEPR). London.
- Donald A, Lawin G and Rouanet L (2020). Reducing the Agricultural Gender Gap in Côte d'Ivoire : How has it Changed? Gender Innovation Lab. World Bank. Washington D.C.
- Duval Y, Utoktham C and Kravchenko A (2018). Impact of implementation of digital trade facilitation on trade costs. ARTNeT Working Paper Series No. 174. Asia-Pacific Research and Training Network on Trade (ARTNeT). Bangkok.
- Edquist C and Johnson B (1997). Institutions and organizations in systems of innovation. In: Edquist C, ed. Systems of Innovation: Technologies, Institutions and Organizations. Routledge. London and New York: 41–63.
- EIU and UNDP (2018). Development 4.0: Opportunities and Challenges for Accelerating Progress towards the Sustainable Development Goals in Asia and the Pacific. Economist Intelligence Unit (EIU) and United Nations Development Programme (UNDP). New York. (accessed 15 May 2020).
- Erkoc TE (2012). Estimation Methodology of Economic Efficiency: Stochastic Frontier Analysis vs Data Envelopment Analysis. *International Journal of Academic Research in Economics and Management Sciences*. 1(1):23.

- European Commission (2017). Industry 4.0 in agriculture: Focus on IoT aspects. Digital Transformation Monitor. European Commission. Brussels. (accessed 10 June 2020).
- European Commission (2018a). Drones in agriculture. Digital Transformation Monitor. Internal Market, Industry, Entrepreneurship and SMEs, European Commission. Brussels.
- European Commission (2018b). The application of the Union competition rules to the agricultural sector. Report from the Commission to the European Parliament and the Council No. COM(2018) 706 final. European Commission. Brussels.
- European Commission (2020). Commission decides to partially withdraw Cambodia's preferential access to the EU market. European Commission -Trade news. Available at https://trade.ec.europa.eu/doclib/ press/index.cfm?id=2113 (accessed 22 July 2020).
- EY Global (2017). How digital agriculture and big data will help to feed a growing world. Available at https://www.ey.com/en_gl/advisory/how-digitalagriculture-and-big-data-will-help-to-feed-agrowing-world (accessed 8 June 2020).
- Ezrachi A and Stucke ME (2016). Virtual Competition. The Promise and Perils of the Algorithm-Driven Economy. Harvard University Press. Cambridge, Massachusetts.
- Fagerberg J and Verspagen B (2020). Technological revolutions, structural change & catching-up. Woking Paper No. 2020–012. United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT). Maastricht. (accessed 31 March 2020).
- FAO (2005). Modernizing National Agricultural Extension Systems. A Practical Guide for Policy-Makers of Developing Countries. Food and Agriculture Organization of the United Nations (FAO). Rome.
- FAO (2009). Feeding the World in 2050. World Summit on Food Security, Rome 16–18 November 2009.Food and Agriculture Organization of the United Nations (FAO). Rome.
- FAO (2011a). Save and Grow: A Policymaker's Guide to the Sustainable Intensification of Smallholder Crop Production. Food and Agriculture Organization of the United Nations (FAO). Rome.
- FAO. (2011b). Women in Agriculture: Closing the Gender Gap for Development. The state of food and agriculture, No. 2010/11. (FAO). Rome.
- FAO (2017). *The Future of Food and Agriculture Trends and Challenges*. Food and Agriculture Organization of the United Nations (FAO). Rome.
- FAO (2018a). Future of Food and Agriculture 2018 Alternative Pathways to 2050. Food and Agriculture Organization of the United Nations. Rome.

- FAO (2018b). Our World Is Urbanizing Is Food on Your Agenda? Food and Agriculture Organization of the United Nations (FAO). Rome.
- FAO (2018c). E-Agriculture in Action: Drones for Agriculture. Food and Agriculture Organization of the United Nations (FAO). Bangkok.
- FAO, IFAD, UNICEF, WFP and WHO (2019). The State of Food Security and Nutrition in the World 2019. Safeguarding against Economic Slowdowns and Downturns. Food and Agriculture Organization of the United Nations (FAO). Rome.
- Feindouno S and Goujon M (2016). The retrospective economic vulnerability index, 2015 update. Working Paper No. 147. Fondation pour les études et recherches sur le développement international (Ferdi). Clermont-Ferrand.
- Fetter R, Fuller A, Porcaro J and Sinai C (2020). You can't fight pandemics without power—electric power. Future Development, Brookings Institution. Available at https://www.brookings.edu/blog/future-development/2020/06/05/you-cant-fight-pandemics-without-power-electric-power/ (accessed 8 June 2020).
- Foresight (2013). Future of manufacturing: a new era of opportunity and challenge for the UK. Project Report. The Government Office for Science. London. (accessed 26 May 2020).
- Frey C and Osborne M (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? *Oxford Martin.* 114.
- Friede M et al. (2011). WHO initiative to increase global and equitable access to influenza vaccine in the event of a pandemic: Supporting developing country production capacity through technology transfer. *Vaccine*. 29(Supplement 1): A2–A7.
- Fuglie KO, Gautam M, Goyal A and Maloney WF (2020). Harvesting Prosperity: Technology and Productivity Growth in Agriculture. World Bank. Washington D.C.
- Gadzala A (2018). 3D Printing: Shaping Africa's Future. Issue Brief., Africa Center. Washington (DC) (accessed 11 June 2020).
- Gagnon JE (2007). Productive Capacity, Product Varieties, and the Elasticities Approach to the Trade Balance. *Review of International Economics*. 15(4):639–659.
- Garcia E (2014). The Need to Address Noncognitive Skills in the Education Policy Agenda. EPI Briefing Paper No. 386. Economic Policy Institute. Washington D.C. (accessed 26 July 2020).
- Gauri P (2019). How the 5th Industrial Revolution Brings the Focus Back to Humanity. Thrive Global. Available at https://thriveglobal.in/stories/how-the-5th-industrial-revolution-brings-the-focus-back-tohumanity/ (accessed 26 May 2020).

- Gebreeyesus M and Mohnen P (2011). Innovation performance and embeddedness in networks: evidence from the Ethiopian footwear cluster. MERIT Working Papers No. 2011–043. United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT). (accessed 11 June 2020).
- Gerszon Mahler D, Christoph Lakner, Castaneda Aguilar A and Wu H (2020). The impact of COVID-19 (Coronavirus) on global poverty: Why sub-Saharan Africa might be the region hardest hit. Available at https://blogs.worldbank.org/opendata/impactcovid-19-coronavirus-global-poverty-why-subsaharan-africa-might-be-region-hardest (accessed 24 April 2020).
- Gezgin E, Huang X, Samal P and Silva I (2017). Digital transformation: Raising supply-chain performance to new levels. McKinsey & Company.
- Giri R, Quayyum SN and Yin R (2019). Understanding Export Diversification: Key Drivers and Policy Implications. International Monetary Fund. Washington (DC).
- Glover D, Sumberg J, Ton G, Andersson J and Badstue L (2019). Rethinking technological change in smallholder agriculture. *Outlook on Agriculture*. 48(3):169–180.
- Gökce Dessemond E (2019). Restoring competition in "'winner-took-all'" digital platform markets. UNCTAD Research Paper No. 40. UNCTAD. Geneva.
- Grant Thornton (2018). 2018 CFO Insights on New Technologies. Survey Report. Grant Thornton.
- Grow Asia (2019). Driving AgriTech Adoption: Insights from Southeast Asia's Farmers. Grow Asia Partnership Ltd. Singapore.
- Grubler A (2012). Energy transitions research: Insights and cautionary tales. *Energy Policy*. 508–16.
- GSMA (2016). Agricultural Value-Added Services (Agri VAS) Toolkit 2.0. GSMA. London.
- GSMA (2020a). Mobile Gender Gap Report 2020. GSMA. London.
- GSMA (2020b). Digital credit scoring for farmers: Opportunities for agritech companies in Myanmar. GSMA. London.
- Guillaumont P (2009). Caught in a Trap: Identifying the Least Developed Countries. Economica. Paris.
- Guillaumont P (2011). The concept of structural economic vulnerability and its relevance for the identification of the least developed countries and other purposes (Nature, measurement, and evolution). CDP Background Paper No. 12. United Nations publication. Sales No. ST/ESA/2011/ CDP/12, New York (NY).

- Guo X, Li G-R, McAleer M and Wong W-K (2018). Specification Testing of Production in a Stochastic Frontier Model. *Sustainability*. 10(9):3082.
- Hagemann H, Landesmann M and Scazzieri R (2003). Introduction. In: Hagemann H,, Landesmann M, and Scazzieri R, eds. *The Economics of Structural Change*. Elgar. Cheltenham (UK) and Northampton (MA): xi–xlii.
- Haldin-Herrgard T (2000). Difficulties in diffusion of tacit knowledge in organizations. *Journal of Intellectual Capital*. 1(4):357–365.
- Hallward-Driemeier M and Nayyar G (2017). *Trouble in the Making?: The Future of Manufacturing-Led Development*. The World Bank.
- Hausmann R and Chauvin J (2015). Moving to the Adjacent Possible: Discovering Paths for Export Diversification in Rwanda. CID Working Papers No. 294. Center for International Development at Harvard University. (accessed 10 October 2019).
- Hausmann R and Panizza U (2003). On the determinants of Original Sin: an empirical investigation. *Journal of International Money and Finance*. Regional and International Implications of the Financial Instability in Latin America. 22(7):957–990.
- Hausmann R and Rodrik D (2003). Economic development as self-discovery. *Journal of Development Economics*. 14th Inter-American Seminar on Economics. 72(2):603–633.
- Helal Uddin Ahmed (2019). Pharmaceutical sector flourishing. The Financial Express. Available at https://www.thefinancialexpress.com.bd/views/ pharmaceutical-sector-flourishing-1574867109 (accessed 24 July 2020).
- Hendrix CS and Salehyan I (2012). Climate change, rainfall, and social conflict in Africa. *Journal of Peace Research*. 49(1):35–50.
- Hofmann B, Shim I and Shin HS (2020). Original sin redux and policy responses in emerging market economies during the COVID-19 pandemic. In: Djankov S, and Panizza U, eds. *COVID in Developing Economies*. Centre for Economic Policy Research (CEPR). London: 353–361.
- Htun P and Bock P (2017). Mobilizing Myanmar: A Smartphone Revolution Connects The Poor With Economic Opportunity. Myanmar FSP Framework Assessment and Feasibility Study. Partners Asia. Oakland (CA).
- Hulten CR and Isaksson A (2007). Why Development Levels Differ: The Sources of Differential Economic Growth in a Panel of High and Low Income Countries. NBER Working Paper No. 13469. National Bureau of Economic Research (NBER). (accessed 22 April 2020).

- Huyer S (2016). Closing the gender gap in agriculture. *Gender Technology and Development*. 20(2):105–116.
- Hyndman RJ, King ML, Pitrun I and Billah B (2005). Local linear forecasts using cubic smoothing splines. *Australian and New Zealand Journal of Statistics*. 47(1):87–99.
- liyama M et al. (2018). Addressing the paradox the divergence between smallholders' preference and actual adoption of agricultural innovations. *International Journal of Agricultural Sustainability*. 16(6):472–485.
- ILO (2020a). Protecting migrant workers during the COVID-19 pandemic: Recommendations for Policymakers and Constituents. Policy Brief. International Labour Organization (ILO). Geneva.
- ILO (2020b). ILO Monitor: COVID-19 and the world of work. Third edition April. Available at https://www. ilo.org/wcmsp5/groups/public/@dgreports/@ dcomm/documents/briefingnote/wcms_743146. pdf (accessed 30 April 2020).
- IMF (2017). Review of the Debt Sustainability Framework for Low Income Countries: Proposed Reforms. IMF Policy Paper. International Monetary Fund (IMF). Washington D.C. (accessed 16 October 2020).
- IMF (2020a). World Economic Outlook: The Great Lockdown (Chapter 1). International Monetary Fund (IMF). Washington D.C.
- IMF (2020b). Six Charts Show How COVID-19 Is an Unprecedented Threat to Development in Sub-Saharan Africa. IMF. Available at https://www.imf. org/en/News/Articles/2020/04/13/na0413202-sixcharts-show-how-covid-19-is-an-unprecedentedthreat-to (accessed 17 July 2020).
- IMF (2020c). World Economic Outlook Update June 2020. International Monetary Fund (IMF). Washington (DC).
- International Finance (2019). Technology uptake drives African logistics innovation. Logistics Magazine. https://internationalfinance.com/technologyuptake-drives-african-logistics-innovation/. (accessed 26 October 2020).
- International Rescue Committee (2020). COVID-19 in humanitarian crises: a double emergency. International Rescue Committee. London.
- Islam SN and Iversen K (2018). From "Structural Change" to "Transformative Change": Rationale and Implications. DESA Working Paper No. 155. Department of Economic and Social Affairs.
- ITC (2018). What sells in e-commerce: New evidence from Asian LDCs. International Trade Centre (ITC). Geneva. (accessed 26 October 2020).

- ITU (2019). Measuring digital development: facts and figures 2019. International Telecommunications Union (ITU). Geneva.
- ITU (2020). Measuring Digital Development: ICT Price Trends 2019. International Telecommunication Union (ITU). Geneva, Switzerland.
- Izmestiev A and Klingebiel S (2020). International (development) cooperation in a post-COVID-19 world: a new way of interaction or super-accelerator? Blog from the Development Policy Centre. Available at https://devpolicy.org/international-developmentcooperation-in-a-post-covid-19-world-a-new-wayof-interaction-or-super-accelerator-20200501-1/ (accessed 17 July 2020).
- de Jesus A (2019). Drones for Agriculture Current Applications. Business Intelligence and Analytics. Emerj Artificial Intelligence Research. Woburn, MA. (accessed 9 July 2020).
- John C, Ekpenyong EJ and Nworu CC (2019). Imputation of Missing Values in Economic and Financial Time Series Data Using Five Principal Component Analysis (PCA) Approaches. *Central Bank of Nigeria Journal of Applied Statistics*. (Vol. 10 No. 1):51–73.
- Johnson O (2019). Digital Transformation of Africa: Hype or Reality? *2019 Annual Adebayo Adedeji Lecture*. United Nations Economic Commission for Africa (ECA). Palmeraie Palace Hotel, Marrakech.
- Jones JW et al. (2017). Toward a new generation of agricultural system data, models, and knowledge products: State of agricultural systems science. *Agricultural Systems*. 15(5): 269–288.
- de Jong RM and Sakarya N (2015). The Econometrics of the Hodrick-Prescott Filter. *The Review of Economics and Statistics*. 98(2):310–317.
- Juma C (2015). Infrastructure for innovation. *New African Magazine*. https://newafricanmagazine. com/11031/. (accessed 12 June 2020).
- Juma C (2017). Leapfrogging Progress. The Breakthrough Institute No. 7. https://thebreakthrough.org/ journal/issue-7/leapfrogging-progress. (accessed 7 May 2020).
- Kabir M and Salim R (2010). Can Gravity Model Explain BIMSTEC's Trade? *Journal of Economic Integration*. 25144–166.
- Kalirajan KP and Salim RA (1997). Economic Reforms and Productive Capacity Realisation in Bangladesh: an Empirical Analysis. *Journal of Industrial Economics*. 45(4):387–403.
- Kamasak R (2017). The contribution of tangible and intangible resources, and capabilities to a firm's profitability and market performance. *European Journal of Management and Business Economics*. 26(2):252–275.

- Kerr S and England A (2020). 'They want us to leave' — foreign workers under pressure in the Gulf. Financial Times. Available at https://www. ft.com/content/77c2d7db-0ade-4665-9cb8c82b72c2da66.
- Khaltarkhuu BE and Sun T (2014). World Bank Data Blog. Available at https://blogs.worldbank.org/ opendata/data-show-rise-domestic-creditdeveloping-countries (accessed 11 June 2020).
- Kilonzi F and Kanai CK (2020). Electronic Cargo Tracking System and Its Effects on Revenue Realization in East Africa Member Countries. *International Journal of Scientific and Research Publications (IJSRP)*. 10(1):633–639.
- Kim T, Ko W and Kim J (2019). Analysis and Impact Evaluation of Missing Data Imputation in Day-ahead PV Generation Forecasting. *Applied Sciences*. 9(1):204.
- Klerkx L, Jakku E and Labarthe P (2019). A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda. NJAS – Wageningen Journal of Life Sciences. 90–91100315.
- Knabke T and Olbrich S (2018). Building novel capabilities to enable business intelligence agility: results from a quantitative study. *Information Systems and e-Business Management*. 16(3):493–546.
- Knoblauch AM et al. (2019). Bi-directional drones to strengthen healthcare provision: experiences and lessons from Madagascar, Malawi and Senegal. *BMJ Global Health*. 4(4):e001541.
- Kopf D (2018). Stop obsessing about GDP growth— GDP per capita is far more important. Quartz. Available at https://qz.com/1194634/the-worldbank-wont-stop-reporting-gdp-instead-of-gdp-percapita-and-it-is-driving-me-crazy/ (accessed 17 June 2020).
- Kose MA, Nagle P, Ohnsorge F and Sugawara N, eds. (2020). *Global Waves of Debt: Causes and Consequences*. The World Bank. Washington D.C.
- Krishnan A, Banga K and Feyertag J (2020). AG-Platforms in East Africa: National and regional policy gaps. SET Supporting Economic Transformation. ODI and EIF. London. (accessed 6 August 2020).
- Kumbhakar SC and Lovell CAK (2000). *Stochastic Frontier Analysis*. Cambridge University Press. Cambridge.
- Kumbhakar SC and Tsionas EG (2011). Some Recent Developments in Efficiency Measurement in Stochastic Frontier Models. *Journal of Probability and Statistics*. 20111–25.
- Kumbhakar SC, Wang H-J and Horncastle AP (2015). A Practitioner's Guide to Stochastic Frontier

Analysis Using Stata. Cambridge University Press. Cambridge.

- Laborde D, Martin W and Vos R (2020). Poverty and food insecurity could grow dramatically as COVID-19 spreads. IFPRI. Available at https://www.ifpri.org/ blog/poverty-and-food-insecurity-could-growdramatically-covid-19-spreads (accessed 30 April 2020).
- Lall S (1992). Technological capabilities and industrialization. *World Development*. 20(2):165–186.
- Lange G-M, Wodon Q and Carey K, eds. (2018). The Changing Wealth of Nations 2018: Building a Sustainable Future. World Bank. Washington (DC).
- Lawder D and Shalal A (2020a). IMF's Georgieva says world in recession, countries must "go big" on spending. Reuters. Available at https://www. reuters.com/article/us-health-coronavirus-imfidUSKBN21E25S (accessed 15 July 2020).
- Le Nestour A and Moscoviz L (2020). Five Findings from a New Phone Survey in Senegal. Center for Global Development. Available at https://www.cgdev. org/blog/five-findings-new-phone-survey-senegal (accessed 20 May 2020).
- Llewellyn RS and Brown B (2020). Predicting Adoption of Innovations by Farmers: What is Different in Smallholder Agriculture? *Applied Economic Perspectives and Policy*. 42(1):100–112.
- Mach KJ et al. (2019). Climate as a risk factor for armed conflict. *Nature*. 571(7764):193–197.
- Maclean R and Marks S (2020). 10 African Countries Have No Ventilators. That's Only Part of the Problem. The New York Times. Available at https:// www.nytimes.com/2020/04/18/world/africa/africacoronavirus-ventilators.html (accessed 28 July 2020).
- Mahmud F (2020). Bangladesh scientists create \$3 kit. Can it help detect COVID-19? Aljazeera. Available at https://www.aljazeera.com/news/2020/03/ bangladesh-scientists-create-3-kit-detectcovid-19-200323035631025.html (accessed 15 June 2020).
- Makles A (2012). Stata Tip 110: How to Get the Optimal K-Means Cluster Solution. *The Stata Journal*. 12(2):347–351.
- Manhas K (2019). Why the agtech boom isn't your typical tech disruption. *World Economic Forum, Global Agenda.*
- Manyika J et al. (2013). Lions go digital: The Internet's transformative potential in Africa. Mckinsey & Company. (accessed 19 May 2020).
- Marx B, Stoker T and Suri T (2013). The Economics of Slums in the Developing World. *Journal of Economic Perspectives*. 27(4):187–210.

- Massinga Loembé M et al. (2020). COVID-19 in Africa: the spread and response. *Nature Medicine*. 26(7): 999–1003.
- McMillan M, Rodrik D and Sepúlveda C, eds. (2017). Structural change, fundamentals, and growth: A framework and case studies. International Food Policy Research Institute (IFPRI). Washington (DC).
- McMillan MS and Rodrik D (2011). Globalization, structural change and productivity growth. NBER Working Paper No. 17143. National Bureau of Economic Research (NBER). Cambridge (MA). (accessed 26 October 2014).
- Mekasha K (2015). Technology Adoption of Ethiopian Manufacturing firms: the Case of Textile and Leather Sector. Addis Ababa University. Available at http:// etd.aau.edu.et/handle/123456789/8300 (accessed 29 July 2020).
- Mensah J (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*. 5(1):1653531, Casadevall S R, ed, Cogent OA.
- Merriott D (2016). Factors associated with the farmer suicide crisis in India. *Journal of Epidemiology and Global Health*. 6(4):217.
- Mikalef P, Pappas IO, Krogstie J and Giannakos M (2018). Big data analytics capabilities: a systematic literature review and research agenda. *Information Systems and e-Business Management*. 16(3):547–578.
- Miroudot S (2017). The Servicification of Global Value Chains: Evidence and Policy Implications. Presented at the UNCTAD Multi-year Expert Meeting on Trade, Services and Development, Geneva,18–20 July 2017. Geneva. Available at https://unctad.org/ meetings/en/Presentation/c1mem5_2017_124_ S3_Miroudot_2.pdf.
- Mittal S (2016). Role of Mobile-phone enabled Climate Information Services in gender-inclusive agriculture. *Gender, Technology and Development*. 20(2):200–217.
- Mkandawire T (2011). Running while others walk: Knowledge and the challenge of Africa's development. *Africa Development*. 361–36.
- Monga C and Lin JY (2019). Introduction: Structural transformation Overcoming the cruse of destiny. In: Monga C, and Lin J Y, eds. *The Oxford Handbook of Structural Transformation*. Oxford University Press. Oxford: 1–32.
- Moser CM and Barrett CB (2003). The disappointing adoption dynamics of a yield-increasing, low externalinput technology: the case of SRI in Madagascar. *Agricultural Systems*. 76(3):1085–1100.
- Moyo M-J and Lozansky T (2020). Working with Africa's apparel makers to produce personal protective equipment. World Bank Blogs. Available at https://

blogs.worldbank.org/nasikiliza/working-africasapparel-makers-produce-personal-protectiveequipment (accessed 16 June 2020).

- Mukasa AN (2018). Technology adoption and risk exposure among smallholder farmers: Panel data evidence from Tanzania and Uganda. *World Development*. 105: 299–309.
- Mulla D and Khosla R (2015). Historical Evolution and Recent Advances in Precision Farming. In: Lal R, and Stewart B, eds. *Soil-Specific Farming*. CRC Press. Boca Raton, London and New York: 1–36.
- Munnik J and Chen A (2020). Alcohol ban has South African distilleries pivoting to a new product. CNN. Available at https://www.cnn.com/2020/04/21/ africa/south-africa-alcohol-ban-gin-distillerieshand-sanitzer-spc-intl/index.html (accessed 16 June 2020).
- Murray U, Gebremedhin Z, Brychkova G and Spillane C (2016). Smallholder Farmers and Climate Smart Agriculture: Technology and Labor-productivity Constraints amongst Women Smallholders in Malawi. *Gender, Technology and Development*. 20(2): 117–148.
- Nadvi K and Schmitz H (1994). Industrial Clusters in Less Developed Countries: Review of Experiences and Research Agenda. Discussion Paper No. 339. Institute of Development Studies. Brighton, England.
- National Research Council (1997). Precision Agriculture in the 21st Century: Geospatial and Information Technologies in Crop Management. National Academy of Sciences Press. Washington, DC.
- Nayyar G, Vargas Da Cruz MJ and Zhu L (2018). Does Premature Deindustrialization Matter? The Role of Manufacturing versus Services in Development. Policy Research Working Paper No. WPS8596. The World Bank, 1–28. (accessed 16 June 2020).
- Nazim Uddin Bhuiyan, Abdul Hakim and Fakhrul Alam (2019). Competitiveness and Global Prospects of Pharmaceutical Industry of Bangladesh : An Overview. *The Cost and Management*. 47(5):10–22.
- Nebe C and Jalloh A-B (2020). Coronavirus pandemic driving tech solutions in sub-Saharan Africa. Deutsche Welle. Available at https://www.dw.com/ en/coronavirus-pandemic-driving-tech-solutionsin-sub-saharan-africa/a-53175841 (accessed 28 July 2020).
- Nkamleu GB (2011). Extensification versus intensification: Revisiting the role of land in African agricultural growth. *African Economic Conference*. United Nations Economic Commission for Africa.
- Nordhaus WD (2002). Productivity Growth and the New Economy. *Brookings Papers on Economic Activity*. 2002(2):211–244.

- Nuclear Threat Initiative, Johns Hopkins Center for Health Security and The Economist Intelligence Unit (2019). Global Health Security Index: building collective action and accountability. Nuclear Threat Initiative.
- Obisesan A (2014). Gender differences in technology adoption and welfare impact among Nigerian Farming households. MPRA Paper No. 58920.
- OECD (1978). Recommendation on Terms and Conditions of Aid. Available at http://www.oecd. org/dac/stats/31426776.pdf.
- OECD (2016). New Industrial Policies OECD Science, Technology and Innovation Outlook 2016. OECD. Paris.
- OECD (2018). Tax Challenges Arising from Digitalisation – Interim Report 2018: Inclusive Framework on BEPS. OECD/G20 base erosion and profit shifting project. OECD. Paris.
- OECD (2019a). Productivity Growth in the Digital Age. OECD. Paris.
- OECD (2019b). Climate Finance Provided and Mobilised by Developed Countries in 2013–17. OECD.
- OECD (2020a). Aid by DAC members increases in 2019 with more aid to the poorest countries. Available at https://www.oecd.org/dac/financing-sustainabledevelopment/development-finance-data/ODA-2019-detailed-summary.pdf.
- OECD (2020b). A systemic resilience approach to dealing with Covid-19 and future shocks. New Approaches to Economic Challenges (NAEC). Organisation for Economic Co-operation and Development (OECD). Paris. (accessed 10 June 2020).
- OECD-DAC (2020). COVID-19 Global Pandemic Joint Statement by the Development Assistance Committee of the Organisation for Economic Cooperation and Development. Tackling Coronavirus (COVID-19) – Contributing to a Global Effort. Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD-DAC). Paris.
- Okereke C and Nielsen K (2020). The problem with predicting coronavirus apocalypse in Africa. Aljazeera. Available at https://www.aljazeera.com/ indepth/opinion/problem-predicting-coronavirusapocalypse-africa-200505103847843.html.
- Oqubay A and Lin JY, eds. (2020). *The Oxford Handbook* of *Industrial Hubs and Economic Development*. Oxford Handbooks. Oxford University Press. Oxford, New York.
- Osakwe PN and Kilolo J-M (2018). What drives export diversification? New evidence from a panel of developing countries. UNCTAD Research Paper.
- Oseni G, Corral P, Goldstein M and Winters P (2015). Explaining Gender Differentials in Agricultural

Production in Nigeria. *Agricultural Economics*. 46(3):281–462.

- Palmer D, Nguyen Phillips A, Kiron D and Buckley N (2017). Achieving Digital Maturity. MIT Sloan Management Review No. 59180. MIT Sloan and Deloitte. Boston, MA. (accessed 2 July 2020).
- Palmer D, Phillips A-N, Kiron D and Buckley N (2018). Coming of age digitally: Learning, leadership and legacy. MIT Sloan Management Review No. 59480. MIT Sloan and Deloitte Insights. Massachusetts.
- Pappas IO, Mikalef P, Giannakos MN, Krogstie J and Lekakos G (2018). Big data and business analytics ecosystems: paving the way towards digital transformation and sustainable societies. *Information Systems and e-Business Management*. 16(3):479–491.
- Peters K et al. (2020). Climate change, conflict and fragility: an evidence review and recommendations for research and action. Overseas Development Institute (ODI). London. (accessed 14 June 2020).
- PwC (2017). Winning in mature markets. PricewaterhouseCoopers (PwC). Singapore.
- Ray DK et al. (2019). Climate change has likely already affected global food production. *PLOS ONE*. 14(5):e0217148.
- Reuters (2020b). "All my dreams are shattered": coronavirus crushes Asia's garment industry. 19 May.
- Rodrik D (2011). The Globalization Paradox: Democracy and the Future of the World Economy. Norton. New York.
- Rodrik D (2016). Premature deindustrialization. *Journal* of *Economic Growth*. 21(1):1–33.
- Rodrik D (2018). New technologies, global value chains, and the developing economies. *Pathways for Prosperity Commission Background Paper Series; no.* 1. University of Oxford, Pathways for Prosperity Commission.
- Roest J and Konijnendijk V (2018). Smartphones Are Common in Myanmar: Is Digital Finance Far Behind? CGAP. Available at https://www.cgap.org/ blog/smartphones-are-common-myanmar-digitalfinance-far-behind (accessed 6 July 2020).
- Roland Berger (2019). Farming 4.0: How precision agriculture might save the world. Precision farming improves farmer livelihoods and ensures sustainable food production. Roland Berger Focus. Roland Berger. Frankfurt.
- Røttingen J-A and Chamas C (2012). A New Deal for Global Health R&D? The Recommendations of the Consultative Expert Working Group on Research and Development (CEWG). *PLoS Medicine*. 9(5).

- Saiz-Rubio V and Rovira-Más F (2020). From Smart Farming towards Agriculture 5.0: A Review on Crop Data Management. *Agronomy*. 10(2):207.
- Sako M and Zylberberg E (2019). Supplier strategy in global value chains: shaping governance and profiting from upgrading. *Socio-Economic Review*. 17(3):687–707.
- Sapsford R, Tsourapas G, Abbott P and Teti A (2019). Corruption, Trust, Inclusion and Cohesion in North Africa and the Middle East. *Applied Research in Quality of Life*. 14(1): 1–21.
- Savić D (2019). From Digitization, Through Digitalization, to Digital Transformation. *Medford*. 43(1): 36–39.
- Scarpetta S, Bassanini A, Pilat D and Schreyer P (2000). Economic Growth In The OECD Area: Recent Trends At The Aggregate And Sectoral Level. SSRN Electronic Journal. http://dx.doi.org/10.2139/ ssrn.241568.
- Schmidhuber J and Meyer S (2014). Has the Treadmill Changed Direction? WTO Negotiations in the Light of a Potential New Global Agricultural Market Environment. Overview Paper. E15Initiative. International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum. Geneva.
- Schumpeter JA (1926). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. Transaction Publishers. New Brunswick (NJ) and London.
- Shah S, Soriano CB and Coutroubis AD (2017). Is big data for everyone? the challenges of big data adoption in SMEs. 2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM). IEEE. Singapore: 803–807.
- Sher D (2019). Five Footwear Industry Leaders That Use 3D Printing for Production Today: AM is clearly the way to go at adidas, Nike, New Balance, Reebok and Under Armor. Available at https://www. smartechanalysis.com/blog/five-footwear-industrycompanies-use-3d-printing-today/ (accessed 5 May 2020)
- Singh KM, Kumari P, Ahmad N and Shekhar D (2019). Role of women in agriculture: Technology-led, gender sensitive policy options. MPRA Paper No. 98070. University Library of Munich, Germany.
- SmarTech (2019). SmarTech Issues New Report Projecting Footwear AM and 3D Printed Footwear Will Generate \$6.5 Billion Yearly Revenues by 2029. News article. SmarTech Analysis. Crozet, VA. (accessed 5 May 2020).
- Sodano V and Verneau F (2014). Competition Policy and Food Sector in the European Union. *Journal* of International Food & Agribusiness Marketing. 26(3):155–172.

- Sorbe S, Gal P and Millot V (2018). Can productivity still grow in service-based economies? Literature overview and preliminary evidence from OECD countries. Economics Department Working Papers No. 1531. Organisation for Economic Co-operation and Development (OECD). Paris.
- Sovacool BK, Tan-Mullins M, Ockwell D and Newell P (2017). Political economy, poverty, and polycentrism in the Global Environment Facility's Least Developed Countries Fund (LDCF) for Climate Change Adaptation. *Third World Quarterly*. 38(6): 1249–1271.
- Sparling N (2018). Impact Terra Raises \$3m to Support Smallholder Farmers in Myanmar. AgFunder. https:// agfundernews.com/impact-terra-social-enterprisemyanmar-seed.html. (accessed 14 July 2020).
- Streatfield PK and Karar ZA (2008). Population Challenges for Bangladesh in the Coming Decades. *Journal of Health, Population, and Nutrition.* 26(3): 261.
- Sumner A, Hoy C and Ortiz-Juarez E (2020). Estimates of the impact of COVID-19 on global poverty. WIDER Working Paper No. 43/2020. United Nations University – World Institute for Development Economic Research (UNU-WIDER). Helsinki. (accessed 24 April 2020).
- Sumner A, Ortiz-Juarez E and Hoy C (2020). Precarity and the pandemic: COVID-19 and poverty incidence, intensity, and severity in developing countries. WIDER Working Paper No. 77. United Nations University – World Institute for Development Economic Research (UNU-WIDER). Helsinki. (accessed 12 June 2020).
- Surmeier A (2020). Dynamic capability building and social upgrading in tourism – Potentials and limits of sustainability standards. *Journal of Sustainable Tourism*. 28(10):1498–1518.
- Sustainable Infrastructure Partnership et al. (2020). Investing in sustainable and resilient infrastructure – "Principles for recovery." United Nations Environment Programme. Available at https://www. greengrowthknowledge.org/sites/default/files/ downloads/resource/SustainableInfrastructure-PrinciplesforRecovery.pdf.
- Talavera JM et al. (2017). Review of IoT applications in agro-industrial and environmental fields. *Computers and Electronics in Agriculture*. 142283–297.
- Tantalaki N, Souravlas S and Roumeliotis M (2019). Data-Driven Decision Making in Precision Agriculture: The Rise of Big Data in Agricultural Systems. *Journal of Agricultural & Food Information*. 20(4):344–380.
- Thirlwall AP (1979). The balance of payments constraint as an explanation of the international growth rate differences. *PSL Quarterly Review*. 32(128):.
- Thu HL (2020). This tech startup is improving yields for farmers in Myanmar. TechInAsia. Available at https://

www.techinasia.com/village-link-yields-farmers (accessed 14 July 2020).

- Thum-Thysen A, Voigt P, Bilbao-Osorio B, Maier C and Ognyanova D (2017). Unlocking Investment in Intangible Assets. European Economy Discussion Papers No. 047. European Commission. Brussels.
- TRALAC (2018). Tanzania, Uganda survive as Rwanda is removed from Agoa beneficiaries list. TRALAC – Trade Law Centre. Available at https://www.tralac. org/news/article/12904-tanzania-uganda-surviveas-rwanda-is-removed-from-agoa-beneficiarieslist.html (accessed 22 July 2020).
- Travaly Y, Mare A and Kunda E (2020). Learning from the best: Evaluating COVID-19 responses and what Africa can learn. Next Einstein Forum. Kigali, Rwanda.
- Tregenna F (2015). Deindustrialisation, structural change and sustainable economic growth. UNU-MERIT Working Paper No. 2015–032. United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT). Maastricht. (accessed 18 August 2015).
- Truman E (2020). The G-20 must wake up to the COVID-19 crisis. PIIE Realtime Economic Issues Watch. Available at https://www.piie.com/blogs/ realtime-economic-issues-watch/g-20-must-wake-covid-19-crisis (accessed 15 July 2020).
- Tsan M, Totapally S, Hailu M and Addom BK (2019). The Digitalisation of African Agriculture Report 2018–2019. Technical Centre for Agricultural and Rural Cooperation (CTA) and Dalberg Advisors. Wageningen. (accessed 13 July 2020).
- Udry C (2010). The economics of agriculture in Africa: Notes toward a research program. *African Journal* of *Agricultural and Resource Economics*. 5(1).
- UN (2020). Policy Brief: The Impact of COVID-19 on Food Security and Nutrition. United Nations (UN). New York.
- UN DESA (2019). *World Population Prospects 2019*. United Nations Department of Economic and Social Affairs (UN DESA), Population Division. New York.
- UN DESA (2020). COVID-19 pandemic deals a huge blow to the manufacturing exports from LDCs. Policy Brief No. 71. United Nations Department of Economic and Social Affairs (UNDESA). New York. (accessed 26 May 2020).
- UN WOMEN (2019). The gender gap in agricultural productivity in Sub-Saharan Africa: Causes, costs and solutions. Policy Brief No. 11. United Nations Entity for Gender Equality and the Empowerment of Women (UN Women).
- UN Women (2020). As COVID-19 exposes the fault lines of gender equality, a strong focus on violence

against women at the UN General Assembly. Available at https://www.unwomen.org/en/news/ stories/2020/9/press-release-focus-on-violenceagainst-women-at-the-un-general-assembly.

- UNCTAD (forthcoming). UNCTAD's Productive Capacities Index: The Methodological Approach and Results. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (1999). Policies and non-fiscal measures for upgrading SME clusters - an assessment. Trade and Development Board Commission on Enterprise, Business Facilitation and Development Fourth Session Geneva, 19-23 July 1999 Item 3 of the provisional agenda No. TD/B/COM.3/22. UNCTAD. Geneva.
- UNCTAD (2006). *The Least Developed Countries Report* 2006: *Developing Productive Capacities*. United Nations publication. Sales No. E.06.II.D.9. New York and Geneva.
- UNCTAD (2007). The Least Developed Countries Report 2007: Knowledge, Technological Learning and Innovation for Development. United Nations publication. Sales No. E.07.II.D.8. New York and Geneva.
- UNCTAD (2009). The Least Developed Countries Report 2009: The State and Development Governance. United Nations publication. Sales No. E.09.II.D.9. New York and Geneva.
- UNCTAD (2010). The Least Developed Countries Report 2010: Towards a New International Development Architecture for LDCs. United Nations publication. Sales No. E.10.II.D.5. New York and Geneva.
- UNCTAD (2012). Economic Development in Africa Report 2012: Structural Transformation and Sustainable Development in Africa. United Nations publication. Sales No. E.12.II.D.10. New York and Geneva.
- UNCTAD (2013a). The Least Developed Countries Report 2013: Growth with Employment for Inclusive and Sustainable Development. United Nations publication. Sales No. E.13.II.D.1. New York and Geneva.
- UNCTAD (2013b). *Trade and Environment Review 2013: Make Agriculture Truly Sustainable Now for Food Security in a Changing Climate.* United Nations. New York and Geneva.
- UNCTAD (2014). The Least Developed Countries Report 2014: Growth with Structural Transformation – A Post-2015 Development Agenda. United Nations publication. Sales No. E.14.II.D.7. New York and Geneva.
- UNCTAD (2015a). The Least Developed Countries Report 2015: Transforming Rural Economies. United Nations publication. Sales No. E.15.II.D.7. New York and Geneva.

- UNCTAD (2015b). The Least Developed Countries Report 2015: Transforming Rural Economies. United Nations publication. Sales No. E.15.II.D.7. New York and Geneva.
- UNCTAD (2015c). *Making Trade Work for Least Developed Countries: A Handbook on Mainstreaming Trade*. Trade and Poverty Paper Series, No. 5. Geneva.
- UNCTAD (2015d). *Trade and Development Report 2015: Making the International Financial Architecture Work for Development*. United Nations publication. Sales No. E.15.II.D.4. New York and Geneva.
- UNCTAD (2016a). *The Least Developed Countries Report* 2016: *The Path to Graduation and Beyond: Making the Most of the Process*. United Nations publication. Sales No. E.16.II.D.9. New York and Geneva.
- UNCTAD (2016b). Trade and Development Report 2016: Structural Transformation for Inclusive and Sustained Growth. United Nations publication. Sales No. E.16.II.D.5. New York and Geneva.
- UNCTAD (2016c). Economic Development in Africa Report 2016: Debt Dynamics and Development Finance in Africa. United Nations publication. Sales No. E.16.II.D.3. New York and Geneva.
- UNCTAD (2016d). Trade misinvoicing in primary commodities in developing countries: The cases of Chile, Côte d'Ivoire, Nigeria, South Africa and Zambia. United Nations Conference on Trade and Development (UNCTAD). New York and Geneva.
- UNCTAD (2016e). Nairobi Maafikiano From decision to action: Moving towards an inclusive and equitable global economic environment for trade and development. No. TD/519/Add.2. United Nations Conference on Trade and Development (UNCTAD). New York and Geneva.
- UNCTAD (2017a). The Least Developed Countries Report 2017: Transformational Energy Access. The least developed countries report, No. 2017. United Nations publication. Sales No. E.17.II.D.6. New York and Geneva.
- UNCTAD (2017b). Activities carried out in the implementation of the Programme of Action for the Least Developed Countries for the Decade 2011–2020: Sixth progress report. Available at https://unctad.org/meetings/en/SessionalDocuments/tdb64d7_en.pdf.
- UNCTAD (2017c). The Least Developed Countries Report 2017: Transformational Energy Access. The least developed countries report, No. 2017. United Nations publication. Sales No. E.17.II.D.6. New York and Geneva.
- UNCTAD (2017d). Information Economy Report 2017: Digitalization, trade and development. United Nations publication. Sales No. E.17.II.D.8, Geneva.

- UNCTAD (2017e). *Trade and Development Report 2017: Beyond Austerity: Towards A Global New Deal.* United Nations publication. Sales No. E.17.II.D.5. New York and Geneva.
- UNCTAD (2018a). The Least Developed Countries Report 2018: Entrepreneurship for Structural Transformation: Beyond Business as Usual. United Nations publication. Sales No. E.18.II.D.6. New York and Geneva.
- UNCTAD (2018b). Selected sustainable development trends in the least developed countries. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2018c). Achieving the Sustainable Development Goals in the Least Developed Countries: A Compendium of Policy Options. UNCTAD. New York and Geneva.
- UNCTAD (2018d). *Trade and Development Report 2018: Power, Platforms and the Free Trade Delusion.* United Nations publication. Sales No. E.18.II.D.7. New York and Geneva.
- UNCTAD (2018e). Financing for development: Debt and debt sustainability and interrelated systemic issues. TD/B/EFD/2/2. Available at https://unctad.org/ meetings/en/SessionalDocuments/tdb_efd2d2_ en.pdf.
- UNCTAD (2018f). Handbook on Duty-Free Quota-Free market access and rules of origin for the Least Developed Countries. United Nations Conference on Trade and Development (UNCTAD). New York and Geneva.
- UNCTAD (2018g). World Investment Report 2018: Investment and New Industrial Policies. United Nations Conference on Trade and Development (UNCTAD). United Nations publication. Sales No. E.18.II.D.4. New York and Geneva.
- UNCTAD (2019a). Selected sustainable development trends in the least developed countries. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2019b). The Least Developed Countries Report 2019: The Present and Future of External Development Finance – Old Dependence, New Challenges. United Nations publication. Sales No. E.20.II.D.2. New York and Geneva.
- UNCTAD (2019c). Activities carried out in the implementation of the Programme of Action for the Least Developed Countries for the Decade 2011–2020. Available at https://unctad.org/meetings/en/SessionalDocuments/tdb66d2_en.pdf.
- UNCTAD (2019d). *Digital Economy Report 2019: Value Creation and Capture : Implications for Developing Countries*. United Nations publication. Sales No. E.19.II.D.17. New York and Geneva.

- UNCTAD (2019e). UNCTAD Rapid eTrade Readiness Assessments of Least Developed Countries: Policy Impact and Way Forward. No. UNCTAD/DTL/ STICT/2019/7. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2019f). Competition issues in the digital economy. Trade and Development Board Trade and Development Commission Intergovernmental Group of Experts on Competition Law and Policy, Eighteenth session Geneva, 10–12 July 2019 No. TD/B/C.I/CLP/54. UNCTAD. Geneva.
- UNCTAD (2019g). Economic Development in Africa Report 2019: Made in Africa – Rules of Origin for Enhanced Intra-African Trade. United Nations publication. Sales No. E.19.II.D.7. New York and Geneva.
- UNCTAD (2019h). Commodities and Development Report 2019: Commodity Dependence, Climate Change and the Paris Agreement. United Nations publication. Sales No. E.19.II.D.18. New York and Geneva.
- UNCTAD (2019i). *World Investment Report 2019: Special Economic Zones*. United Nations publication. Sales No. E.19.II.D.12. New York and Geneva.
- UNCTAD (2019j). *Trade and Development Report 2019: Financing A Global Green New Deal*. United Nations publication. Sales No. E.19.II.D.15. New York and Geneva.
- UNCTAD (2020a). World Investment Report 2020: International Production beyond the Pandemic. United Nations publication. Sales No. E.20.II.D.23. New York and Geneva.
- UNCTAD (2020b). *Trade and Development Repot 2020: From Global Pandemic to Prosperity for All: Avoiding Another Lost Decade*. United Nations publication. Sales No. E.20.II.D.30. New York and Geneva.
- UNCTAD (2020c). The Covid-19 Shock to Developing Countries: Towards a "whatever it takes" programme for the two-thirds of the world's population being left behind. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2020d). Building and Utilizing Productive Capacities in Africa and the Least Developed Countries – A Holistic and Practical Guide. UNCTAD. Geneva.
- UNCTAD (2020e). Ethiopia Science, Technology and Innovation Policy Review. Science, Technology and Innovation Policy Review. UNCTAD. Geneva. (accessed 9 June 2020).
- UNCTAD (2020f). Estimates of Global E-Commerce 2018. UNCTAD Technical Notes on ICT for Development No. 15. UNCTAD. Geneva.
- UNCTAD (2020g). Economic Development in Africa Report 2020: Tackling Illicit Financial Flows for

Sustainable Development in Africa. United Nations publication. Sales No. E.20.II.D.21. New York and Geneva.

- UNCTAD (2020h). The coronavirus shock: a story of another global crisis foretold. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2020i). South-South Cooperation at the time of Covid-19: building solidarity among developing countries. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2020j). From the Great Lockdown to the Great Meltdown: Developing Country Debt in the Time of Covid-19. United Nations Conference on Trade and Development (UNCTAD). Geneva.
- UNCTAD (2020k). The COVID-19 crisis: Accentuating the need to bridge digital divides. Digital Economy Update No. UNCTAD/DTL/INF/2020/1. (UNCTAD). Geneva.
- UNCTAD (2020). Ugandan e-commerce platforms power recovery from COVID-19 crisis. Available at https://unctad.org/news/ugandan-e-commerceplatforms-power-recovery-covid-19-crisis (accessed 27 October 2020).
- UNCTAD and FAO (2017). Commodities and Development Report 2017: Commodity Markets, Economic Growth and Development. Commodities and development report, No. 2017. United Nations. New York Geneva.
- UNCTAD, OECD and WTO (2020). UNCTAD-OECD-WTO Report on G20 Trade and Investment Measures (23rd Report, Joint Summary) June. Available at https://unctad.org/en/PublicationsLibrary/unctad_ oecd2020d23_summary_en.pdf.
- UNCTAD and World Bank (2018). *The Unseen Impact of Non-Tariff Measures: Insights from a New Database*. United Nations publication. Sales No. UNCTAD/ DITC/TAB/2018/2. Geneva.
- UNECA (2015). *Economic Report on Africa 2015: Industrializing through Trade*. United Nations Economic Commission for Africa. Addis Ababa.
- UNECA (2019). Economic Report on Africa 2019: Fiscal Policy for Financing Sustainable Development in Africa. United Nations Economic Commission for Africa. Addis Ababa.
- UNECA (2020). COVID-19: Lockdown exit strategies for Africa | United Nations Economic Commission for Africa. United Nations Economic Commission for Africa (UNECA). Addis Ababa, Ethiopia. (accessed 20 May 2020).
- UNECE (2020). Trade Facilitation White Paper on Smart Containers. Real-time Smart Container data for supply chain excellence. White Paper No. ECE/

TRADE/446. United Nations Economic Commission for Europe (UNECE). Geneva.

- Ungar M (2018). Systemic resilience: principles and processes for a science of change in contexts of adversity. *Ecology and Society*. 23(4) https://doi. org/10.5751/ES-10385-230434.
- UNHCR (2019). Global Trends 2018: Forced Displacement in 2018. Global Trends. United Nations High Commissioner for Refugees (UNHCR). (accessed 29 May 2020).
- UNIDO (2013). Industrial Development Report 2013: Sustaining Employment Growth: The Role of Manufacturing and Structural Change. United Nations publication. Sales No. E.13.II.B.46. Vienna.
- UNIDO (2018). UNIDO Competitive Industrial Performance Report 2018. United Nations Industrial Development Organization (UNIDO). Vienna.
- UNIDO (2019a). Industrial Development Report 2020: Industrializing in the Digital Age. United Nations Industrial Development Organization (UNIDO). Vienna.
- UNIDO (2019b). Absorbing Advanced Digital Production Technologies to Foster Industrialization Evidence from Case Studies in Developing Countries. Background document prepared for the Industrial Development Report 2020. United Nations Industrial Development Organization (UNIDO). Vienna.
- United Nations (2001). Programme of Action for the Least Developed Countries – Adopted by the Third United Nations Conference on the Least Developed Countries in Brussels on 20 May 2001. United Nations publication. Sales No. A/CONF.191/11, New York (NY).
- United Nations (2011). Programme of Action for the Least Developed Countries for the Decade 2011–2020. No. A/CONF.219/3/Rev.1. United Nations publication. Sales No. A/CONF.219/3/Rev.1, Istanbul.
- United Nations (2015a). Paris Agreement. United Nations. Paris.
- United Nations (2015b). Resolution adopted by the General Assembly on 3 June 2015: 69/283. Sendai Framework for Disaster Risk Reduction 2015–2030. No. A/RES/69/283. United Nations. Sendai.
- United Nations (2015c). Transforming our world: the 2030 Agenda for Sustainable Development. No. A/ RES/70/1. United Nations. New York (NY).
- United Nations (2019). Climate change and poverty. Report of the Special Rapporteur on extreme poverty and human rights No. A/HRC/41/39. United Nations. New York. (accessed 12 June 2019).
- United Nations (2020a). *Financing for Sustainable* Development Report 2020. United Nations, United

Nations Inter-Agency Task Force on Financing for Development (UNIATFFD). New York.

- United Nations (2020b). The parlous state of poverty eradication. Report of the Special Rapporteur on extreme poverty and human rights No. A/ HRC/44/40. United Nations. New York. (accessed 12 June 2019).
- UN-OHRLLS (2017). The Africa Regional Report on Improving Transit Cooperation, Trade and Trade Facilitation for the benefit of the landlocked developing countries. Current status and policy implications. UN-OHRLLS. New York.
- USAID (2015). Supporting Digital Financial Services in Myanmar: Assessment of the potential for digital financial services in agriculture value chains. US Agency for International Development (USAID). Washington D.C.
- Uzoamaka JN, Olagunju KO, Njuguna-Mungai E and Mausch K (2019). Is there any gender gap in the production of legumes in Malawi? Evidence from the Oaxaca–Blinder decomposition model. *Review* of Agricultural, Food and Environmental Studies. 10069–92.
- Valensisi G (2020). COVID-19 and global poverty: Are LDCs being left behind? *The European Journal of Development Research*. https://doi.org/10.10/ s41287-020-00314-8.
- Van Reenen J (2019). Where Will Future Jobs and Growth Come From? Presented at the LSE Public Lectures and Events. London. Available at https://www. Ise.ac.uk/Events/2019/05/20190522t1830vOT/ Where-Will-Future-Jobs-and-Growth-Come-From. aspx (accessed 1 September 2020).
- Vandycke N (2012). Transformation through infrastructure. The World Bank. Washington D.C. (accessed 12 June 2020).
- Venter I (2020). Clothing, textile industry in project to produce face masks locally. Available at https:// www.engineeringnews.co.za/article/clothingtextile-industry-in-project-to-produce-face-maskslocally-2020-03-31 (accessed 16 June 2020).
- Vercillo S, Weis T and Luginaah I (2020). A bitter pill: smallholder responses to the new green revolution prescriptions in northern Ghana. *International Journal* of Sustainable Development & World Ecology. 1–11.
- Vos R, Martin W and Laborde D (2020). How much will global poverty increase because of COVID-19? IFPRI. Available at https://www.ifpri.org/blog/ how-much-will-global-poverty-increase-becausecovid-19 (accessed 30 April 2020).
- de Vries GJ, Timmer MP and de Vries K (2015). Structural transformation in Africa: Static gains, dynamic losses. *Journal of Development Studies*. GGDC Research Memorandum. 1–15.

- Wade R (2004). Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization. Princeton University Press. Princeton (NJ) and Oxford (UK).
- WEF (2017). Supply Chain and Transport Briefing. World Economic Forum (WEF). Geneva. (accessed 1 April 2020).
- Whitfield L, Staritz C, Melese AT and Azizi S (2020). Technological Capabilities, Upgrading, and Value Capture in Global Value Chains: Local Apparel and Floriculture Firms in Sub-Saharan Africa. *Economic Geography*. 96(3):195–218.
- WHO (2019). Children: reducing mortality. World Health Organization (WHO). Available at https://www. who.int/news-room/fact-sheets/detail/childrenreducing-mortality (accessed 25 May 2020).
- Wijeweera A, Villano R and Dollery B (2010). Economic Growth and FDI Inflows: A Stochastic Frontier Analysis. *The Journal of Developing Areas*. 43(2):143–158.
- WIPO (2017). Global Innovation Index 2017: Innovation Feeding the World. World Intellectual Property Organization (WIPO). Geneva.
- Wolfert S, Ge L, Verdouw C and Bogaardt M-J (2017). Big Data in Smart Farming – A review. *Agricultural Systems*. 15(3): 69–80.
- Woolcock M, Easterly W and Ritzen J (2000). On Good Politicians and Bad Policies: Social Cohesion, Institutions, and Growth. Policy Research Working Papers. The World Bank.
- World Bank (2011). *More and Better Jobs in South Asia*. World Bank. Washington (DC).
- World Bank (2020a). Combined Project Information Documents/Integrated Safeguards Datasheet (PID/ ISDS). Myanmar Food and Agriculture System Project (P164448) No. PIDISDSA25232. World Bank. Washington (DC).
- World Bank (2020b). COVID-19 crisis through a migration lens. Migration and Development Brief No. 32. World Bank. Washington (DC).

- World Bank (2020c). *Global Economic Prospects, June 2020*. World Bank. Washington (DC).
- World Economic Forum (2016). The Future of Jobs Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution. Global Challenge Insight Report. World Economic Forum. Davos.
- Worldwide Governance Indicators (2020). Worldwide Governance Indicators. Available at https://info. worldbank.org/governance/wgi/ (accessed 29 May 2020).
- WTO (2019). Market access for products and services of export interest to Least Developed Countries. No. WT/COMTD/LDC/W/67. World Trade Organisation (WTO), Sub-Committee on Least Developed Countries. Geneva, Switzerland.
- WTTC (2020). Travel & tourism recovery scenarios 2020 and economic impact from COVID-19. Research Note. World Travel and Tourism Council, London.
- Xu H, Guo H, Zhang J and Dang A (2018). Facilitating dynamic marketing capabilities development for domestic and foreign firms in an emerging economy. *Journal of Business Research*. 86141–152.
- Yigezu YA et al. (2018). Enhancing adoption of agricultural technologies requiring high initial investment among smallholders. *Technological Forecasting and Social Change*. 134199–206.
- Yonah IB, Mourice SK, Tumbo SD, Mbilinyi BP and Dempewolf J (2018). Unmanned aerial vehiclebased remote sensing in monitoring smallholder, heterogeneous crop fields in Tanzania. *International Journal of Remote Sensing*. 39(15–16):5453–5471.
- Zhao C et al. (2017). Temperature increase reduces global yields of major crops in four independent estimates. *Proceedings of the National Academy of Sciences*. 114(35):9326–9331.
- Zhu P (2019). Five Visible and Invisible Forces Behind Digital Innovation. Innovation Management. Available at https://innovationmanagement.se/2019/03/20/ five-visible-and-invisible-forces-behind-digitalinnovation/ (accessed 26 July 2020).