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South-South Integration and the SDGs: *Enhancing Structural Transformation in Key Partner Countries of the Belt and Road Initiative*

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Developing Ethiopia's Digital Economy: Lessons from China

Abstract

The report assesses the state of the digital economy in Ethiopia and explores digital policies and strategies. Moreover, it reviewed China's experience in digital transformation and suggest lessons for Ethiopia. While the digital economy is nascent in Ethiopia, if guided by appropriate policies and strategies it has an immense potential as a crucial sector on its own and as an essential enabler and catalysing factor in triggering productivity in the rest of the economy. China's success in integrating the traditional economic system with ICT was instrumental in boosting its productivity and competitiveness. The report has identified key lessons from China for Ethiopia's digital transformation. The lessons revolve around digital infrastructure investment, data management, digital security, digital governance capability, digital business environment, digital collaboration, coordination, and the need to focus on e-commerce and mobile payment systems.

Key words: Digital Policy, Digital Economy, Ethiopia, China



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Acronyms

CSP	Communication Services Proclamation
EBTI	Ethiopian Biotechnology Institute
EICTDA	Ethiopian ICT Development Authority
GTP	Growth and Transformation Plan
ICT	Information and Communication Technology
IDI	ICT Development Index
IDS	Industrial Development Strategy
ITU	International Telecommunications Union
MiINT	Ministry of Innovation and Technology
MoSHE	Ministry of Science and Higher Education
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PDC	Planning and Development Commission
SDPRP	Sustainable Development and Poverty Reduction Program
TECHIL	Technology and Innovation Institute
TYP	Ten-Year Perspective Plan
VNO	Virtual Network Operators

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1. Introduction

1.1 Background

In the last two decades Ethiopia has registered remarkable economic growth and considerable poverty reduction. Access to social services such as education and health have shown notable improvements though quality and equity issues remain. Key issues relating to the sustainability of growth have arisen as the growth has been largely driven by public investment in infrastructure, resulting in government debt and fiscal space concerns. In terms of sectoral contribution to growth, the service sector has been the main driver despite the government's policy of focusing on agriculture and industry. As a result, despite structural transformation being the focus of government policies over the last decade, as underlined in the first Growth and Transformation Plan (2010–2015) and the second Growth and Transformation Plan (2015–2020), achievements have been less than hoped.

Moreover, as highlighted in the recently crafted Homegrown Economic Reform Agenda document prepared by the government, growth in the last decade came from capital accumulation due to heavy investment rather than total factor productivity gains (Office of the Prime Minister, 2019). The lack of growth in TFP raises sustainability concerns about the growth performance of the last decade.

One potential enabling factor for enhancing productivity and competitiveness is the digital economy. China's success in integrating the traditional economic system with ICT was instrumental in boosting China's productivity (See, for example, Zhang and Chen, 2019). While the digital economy is nascent in Ethiopia, if guided by appropriate policies and strategies it has an immense potential as a crucial sector on its own and as an essential enabler and catalysing factor in triggering productivity in the rest of the economy.

This report assesses the state of the digital economy in Ethiopia and explores digital policies and strategies. Moreover, the report reviewed China's experience in digital transformation and suggest lessons for Ethiopia.

1.2 Brief Overview of the Ethiopian Economy

1.2.1 Key Economic Policies

Economic policies in Ethiopia in the period after 2000 focused on poverty reduction through economic growth in the first period (2000 – 2010) and economic transformation and sustainable growth in the second period (2010- 2020). The ongoing Ten-Year Perspective Plan (2021-2030) aims at sustaining economic growth, poverty reduction, and economic transformation by enhancing productivity and competitiveness of the private sector.

The two national development plans, namely, the Sustainable Development and Poverty Reduction Program (SDPRP) for the period 2002-2005 (MoFED, 2002) and a Plan for Accelerated and Sustained Development to End Poverty (PASDEP) for the period 2005/6-2009/10 (MoFED, 2005) aimed at poverty reduction through rapid economic growth under the auspicious of the Agricultural Development Led Industrialization (ADLI) strategy. The agricultural sector was the center of the program along with social (education and health) and physical infrastructure such as roads.¹ The economy grew on average by about 6% during the SDPRP and 11% during the PASDEP plan period. However, achievements in terms of changing the structure of the economies towards more productive sectors such as manufacturing were limited.

As a response, economic policies after 2010 focused on economic transformation with the preparation of the first Growth and Transformation Plan (GTP-I) spanning 2010 to 2015 and the second GTP-II (2015-2020). During the two GTPs a more active industrial policy, aiming to transform the structure of the economy from agriculture to industry and a higher value services' sector was emphasized (MoFED, 2010; NPC, 2016).

A number of support schemes were directed towards selected export-oriented and import-substitution sectors such as textiles, leather goods, cement, and pharmaceuticals during the first GTP. The interventions included direct capacity building support and fiscal incentives such as tax holidays, reduction of indirect taxes on capital goods and preferential credit to selected sectors. Heavy government investment on infrastructure

¹ The 2002 Industrial Development Strategy (IDS) was also prepared during the SDPRP. However, the SDPRP, does not identify the industrial sector as a key focus of the program despite the approval of the IDS and hence was a case of lack of policy harmonization.

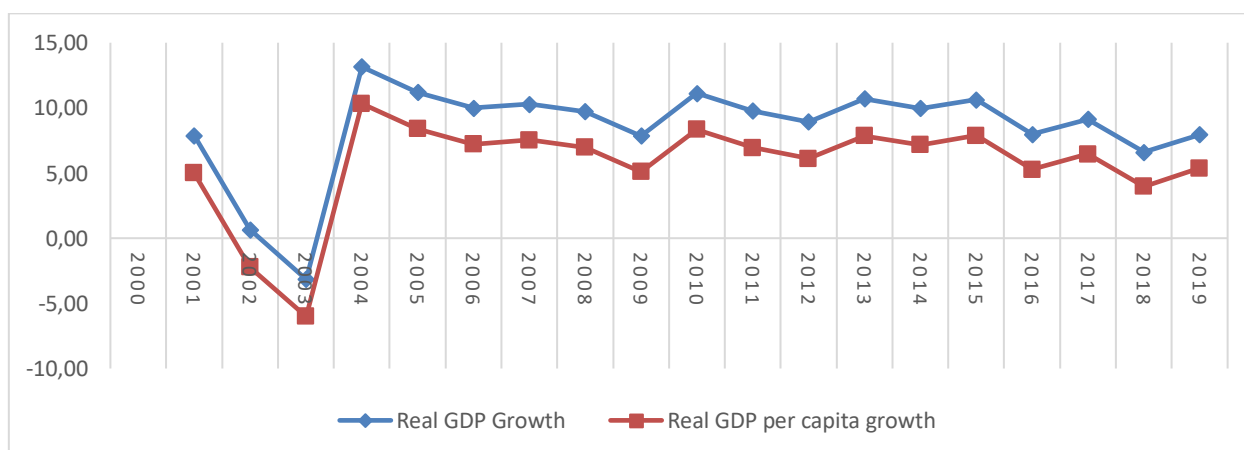
was also envisaged to enhance the competitiveness of the private sector (Gebreyesus, 2013). While achievements in growth in during the first GTP were impressive around 10%, gains in structural transformation remained poor.

During the second GTP (2015-2020) the expansion and development of industrial parks and integrated agro-processing was one of the key big-push industrial policies to address the production and logistics constraints that impede productivity and competitiveness for both domestic and foreign investors. Similar to previous national development plans, real GDP growth during the second GTP period was high about 8%. While the share of manufacturing showed a slight increase to 6% in 2017/8, the overall structure of the economy, however, has not shown significant departure from the first GTP.

1.2.2 Economic Growth, Structure and its Determinants

Ethiopia's real GDP growth between 2000 and 2009 averaged 8.5% while real GDP per capita in the same period was about 6% (Figure 1). For the period between 2010 and 2019, real GDP growth and real GDP per capita growth averaged 9.3% and 6.5%, respectively. The corresponding figures for the 2000-2009 period were 7.5% and 5%. Hence, remarkable economic growth characterised the period 2000-2020 in Ethiopia.

Figure 1: Growth of GDP and GDP Per Capita



Source: author's computation from the PDC²

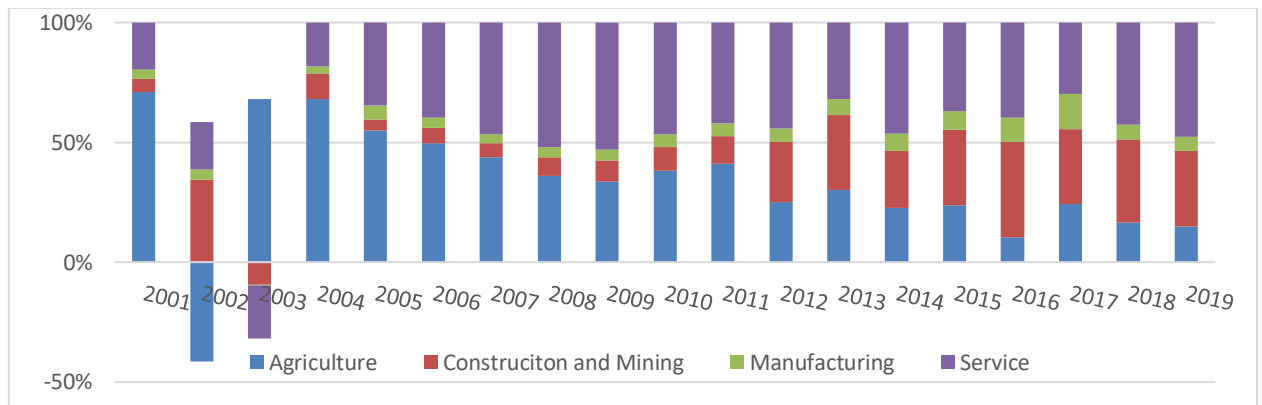
The GDP growth was largely driven by substantial public investment on infrastructure coupled with a solid performance by the service and construction sectors that benefited

² Data was obtained from the Planning and Development Commission (PDC)

from some modest mobility of labor from the agricultural sector. Figure 2 shows that out of the 9.27% average real GDP growth registered between 2010 and 2019, the agricultural sector contributed 2.32 percentage points, construction 2.5 percentage points, manufacturing 0.65 percentage points, and service 3.8 percentage points. Hence, the service and construction sectors have become the dominant drivers of GDP growth in recent years.

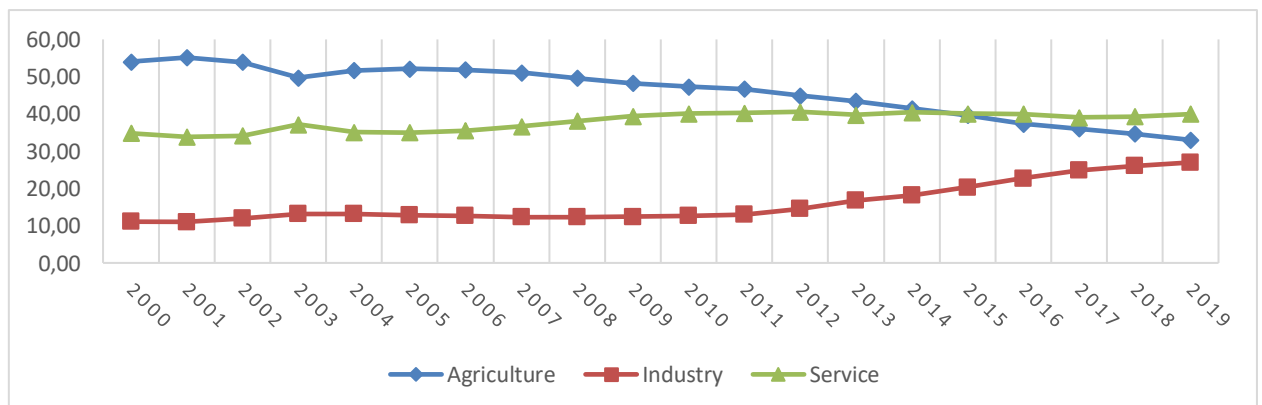
In terms of sectoral contribution to real GDP, the service sector has overtaken agriculture since 2015 as shown in Figure 3. In the year 2000, the share of the agricultural sector to GDP was 54% while the service sector contributed 35%. The remaining 11% came from the industrial sector. In 2019, the service sector contributed 40% of GDP while the agricultural sector contributed 33%. The fast-growing industrial sector contributed 27%. However, construction has been the major contributor within the industrial sector while the manufacturing sector only contributed to a quarter of the industrial output as shown in Figure 4. The contribution of the mining remains insignificant throughout the period.

Figure 2: Sectoral Drivers of Growth



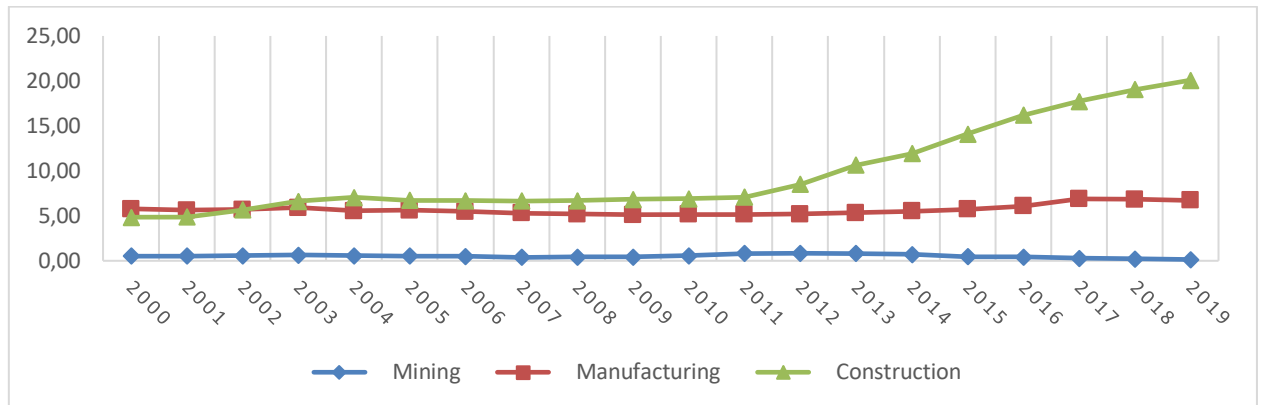
Source: author's computation from the PDC

Figure 3: Sectoral Distribution of GDP



Source: author's computation from the PDC

Figure 4: Sub-Sectoral Distribution of the Industrial Sector



Source: author's computation from the PDC

2. Ethiopia Digital Policy

2.1 Digital Economic Trends

The digital economy in Ethiopia is at its nascent stage. Currently, there are few private sector actors in the digital economy sector and some government-driven digitalization initiatives. Until 2021, Ethiopia retained public monopoly of all telecom services. The Communication Services Proclamation of 2019 creates the basis for market liberalization and allowed licenses to the private sector to participate in telecom service provision.

Despite progress in terms of ICT infrastructure in the last decade, Ethiopia remains at the bottom group of ICT Development Index (IDI) as it is ranked 170 out of 176 with data (in 2017 improving one place from 2016) as shown in Table 1. The IDI is a composite index for measuring progress in ICT and digital trends consisting of access, use, and skills. Ethiopia particularly lags in use and skills of the IDI components compared to its peers. The gap between Ethiopia and its peers is lower in terms of the access component of the IDI. Improvements in access, use and skills components of the IDI will be crucial for a dynamic digital economy that the country envisions by 2025.

Table 1: Comparison of Ethiopia's Standing in IDI in 2017

	Ethiopia	LDC	Africa	Developing
IDI 2017 Value	1.65	2.2	2.64	4.26
IDI 2016 Value	1.42	2.07	2.48	4.07
IDI ACCESS SUB-INDEX	2.35	2.82	3.28	4.8
Fixed-telephone subscriptions per 100 inhabitants	1.13	0.9	1	8.54
Mobile-cellular telephone subscriptions per 100 inhabitants	50.51	67.67	74.6	96.25
International internet bandwidth per Internet user (Bit/s)	2242.35	6000	51000	53000
Percentage of households with computer	5.03	7.64	9.6	34.35
Percentage of households with Internet access	15.37	12.88	16.3	40.43
IDI USE SUB-INDEX	0.72	1.27	1.74	3.32
Percentage of individuals using the Internet	15.37	15.62	19.9	38.98
Fixed (wired)-broadband subscriptions per 100 inhabitants	0.55	0.9	0.4	8.71
Active mobile-broadband subscriptions per 100 inhabitants	5.28	19.1	22.9	43.58
IDI SKILLS SUB-INDEX	2.11	2.82	3.16	5.05
Mean years of schooling	2.6	4.38	5.24	7.4
Secondary gross enrolment ratio	37.7	47.35	50.48	74.88
Tertiary gross enrolment ratio	8.13	8.62	9.49	28.25

Source: ITU (2021)

Another key factor for access and use of digital infrastructure is affordability of ICT services. Despite improvements in access telecom prices remain high in Ethiopia. For example, in 2020 among 180 countries with information on data and mobile package prices, Ethiopia ranked the 31st most expensive with costs estimated to be 13.2% of GNI per capita (ITU, 2021). Telecom monopoly has contributed to the expensive and unreliable telecom service in the country. Moreover, unreliable electric supply has affected the quality of digital services in the country.

Digital divide is also evident in Ethiopia as significant share of the rural population, low-income segments, the elderly, and women have limited access to broadband connectivity due to high costs and inadequate availability.

2.2 Ethiopia Digital Policies and Strategies

In this section we discuss how digital policies have been placed in the context of national development plans in the last two decades and recent progress and prospects.

2.2.1 Digital Policies and Strategies in the national development plans

The 2002-2005 Sustainable Development and Poverty Reduction Plan (SDPRP) recognized the role of ICT as an enabling tool for the economy and had a component for ICT development under the National Capacity Building Program outlining plans to expand ICT courses in higher education. The plan recognised the very low telephone service access and focused on expanding telecom access to rural areas with programs such as Woreda-net cable-net, and Agri-net projects.

The 2005-2010 national development plan known as the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) emphasized ICT development as a means to enhance sustainable development, poverty reduction, human resource development, and good governance. It set clear targets for fixed phone, mobile, and internet access. The ICT Strategy was also prepared in this period for implementation under the auspicious of the Ethiopian ICT Development Authority (EICTDA)

The 2010-2015 plan known as the Growth and Transformation Plan (GTP-I) outlined a continued investment in Telecom infrastructure setting ambitious targets. The Universal Rural Telecom Program and the establishment of an ICT Park in Addis Ababa were some of the notable programs of the GTP-I plan. Moreover, the Cyber Security Regulation was prepared and approved in this period.

The second Growth and Transformation Plan (GTP-II) which span the period 2015- 2020 made the expansion of digital infrastructure as a pillar of capacity building and good governance component. The ICT park which started in the first GTP was operationalized. The acceleration of ICT development via strengthening e-government initiatives and the by industries was among the major strategic objectives of the plan.

Performance in the digital economy as a sector as well as an enabling factor in the last two decades until 2020 has seen rapid expansion but with limited quality and affordability. Hence, access expansion was not accompanied by an actual use by economic actors including the government and the private sector. Sluggish growth in ICT skills in the desired quality of training has also limited digitization in the Ethiopian economy.

Another key feature of the ICT and the digital economy in the last two decades is limited participation of the private sector as the government was the regulator and provider of

telecom services. Moreover, unlike priority sectors such as the manufacturing sector, there has not been clear incentive system for enterprises engaging in the digital economy. Moreover, stringent requirements for FDI engaged in ICT such as minimum USD 200,000 investment requirement while ICT start-ups typical require substantially less investment has hindered its development and potential knowledge diffusion from abroad. Moreover, poor permeance in implementation of digitalization initiatives such as digital IDs have hindered the use and development of the digital economy. The lack of legal and regulatory framework for the digital economy such as regulations for startups and the fragmented implementation of the the National ICT Policy at projects and sector basis rather than national level have contributed to the poor integration of the digital economy with the rest of the Ethiopia economy.

2.2.2 Digital Policies and Strategies in the national development plans: Recent progress

In recent years, the digital economy as a sector on its own and as enabler to the rest of the economy has gained increasing focus by the government.

The ongoing national development plan known as the Ten-Year Perspective Plan (TYPP) that spans the period 2020-2030, a number of programs and initiatives for digital economy have been planned and implementation has started. Some of the major programs include complete and institutionalize Gifted and Talented Center; build a national Datacentre; launch E-Commerce and e-Payment Ecosystem ; completion of establishing East African E-Commerce Logistic Hub in Addis Ababa; producing Big Data Analytics to Support Sectors (Agriculture, Financial, Population Analytics, Bio Informatics, Engineering Design); completion of establishing National Technology Production Hub (Manufacturing, AI-ICT Software, Pharmaceuticals-Nutrition); and the Broadband coverage enhancement Program (100% Businesses use Broadband).

Compared to previous national plans, the ongoing TYPP has laid out clear strategies for the development of the digital economy. Some of the key strategies, regulations, and programs for the digital economy are the Communication Services Proclamation of 2019, the Digital Ethiopia 2025 of the Ministry of Innovation and Technology (MiNT), the National ICT Policy for Higher Education and TVET (MoSHE), and the Start-up and Innovation Business Act.

A) The Ethiopian National ICT Policy and Strategy (2016)

ICT development plays a key role to achieve digital transformation thereby realizing digital economy in Ethiopia. However, the adoption of ICT in the country remains low compared to regional and global levels. Limited usage of broadband service, lack of digital literacy and awareness (mainly in the rural areas), high cost of ICT devices and services, underdeveloped ICT sector with limited private sector involvement, and low level of internet penetrations constraint to fully unleash the potential of small innovative entrepreneurs for transforming the economy (MinT, 2020). To overcome these challenges, the national ICT Policy and Strategy was developed in 2016 (FDRE, 2016) aiming to deploy ICT infrastructure, create the necessary skilled human resources, advance the necessary legal and regulatory framework, and promote ICT usage (in the government, private sector and at societal level). Further, the policy aims to strengthen the role of the private sector to enhance the development of the ICT sector, enhance use of the ICT across the economy, and expand use of ICT across sectors.

Several key interventions to support the implementation of the 2016 national ICT Policy and Strategy have been outlined. Fiscal policy measures intended to stimulate investment in the ICT sector to support its growth including tax incentives and budgetary support. Secondly, the introduction and growth of e-commerce as a key player in economic development. To support e-commerce, ensuring legal and regulatory framework, develop e-payment options, enhance critical role of postal and logistical services, support promotion to raise people awareness, and increasing collaboration with international e-commerce are presumed to play pivotal role. Thirdly, ensuring international recognized standards for ICT goods and service is critical to ensure quality and safety of e-commerce. Fourthly, universal access of ICT services is a bedrock for e-commerce growth in the country. Finally, market monitoring is to ensure the highest quality of ICT network services and their affordability has been underlined.

B) Communication Services Proclamation of 2019 (CSP)

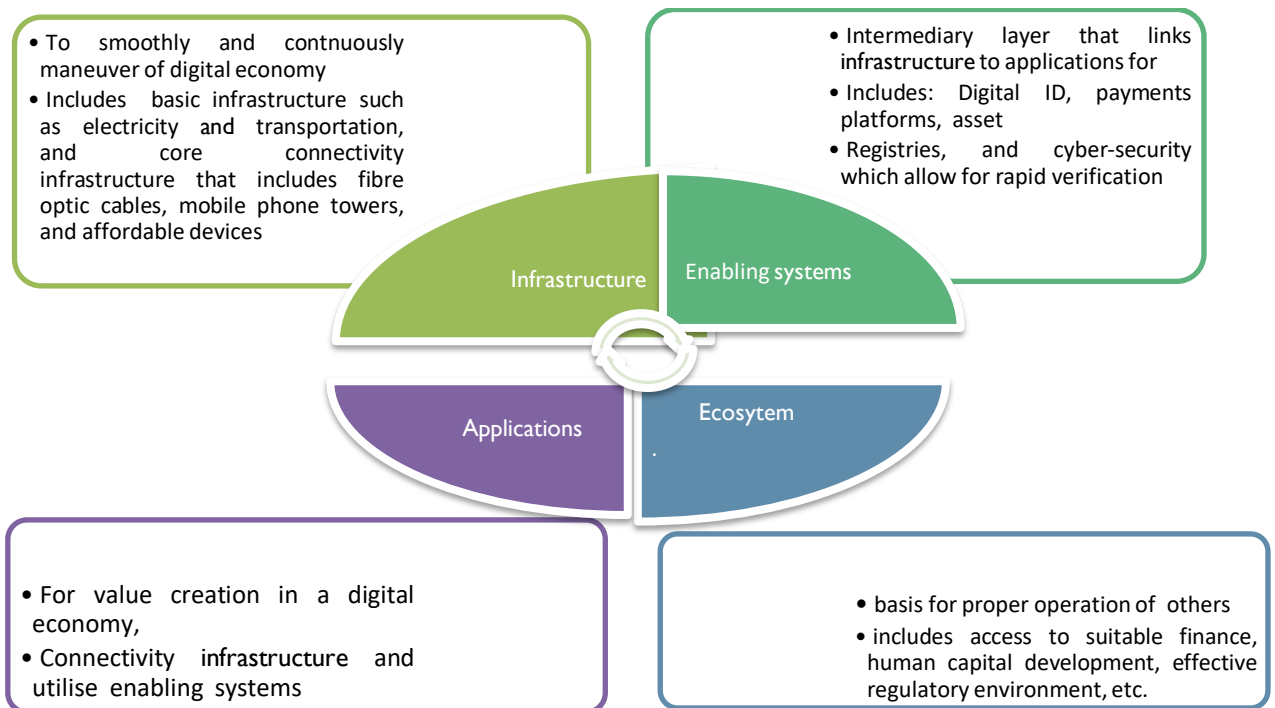
The CSP aims to create the basis for market liberalization and allowed two private licenses to be engaged in the telecom sector. The separation of policy, regulatory and operational functions which were previously all mandates of the government is one of the key developments which can enhance the effectiveness of the digital economy by creating a more affordable and quality ICT infrastructure. According to the CSP, the MiNT is mandated with developing policy instruments, designing various programs, mobilizing

resources, and guiding and monitoring of the country's telecom sector. The Ethiopian Communications Authority (ECA) is mandated to regulate the telecom sector.

C) Digital Ethiopia 2025

This is the first comprehensive digital strategy for Ethiopia which views the digital economy as an important sector on its own and as an enabling factor for the rest of the economy. The development of strategy is based on the digital economy gap assessment taking into account four-part digital economy framework consisting of infrastructure, enabling system, applications and ecosystem (see Figure 5). The components of the framework are highly interlinked.

Figure 5: Four part of digital economy framework

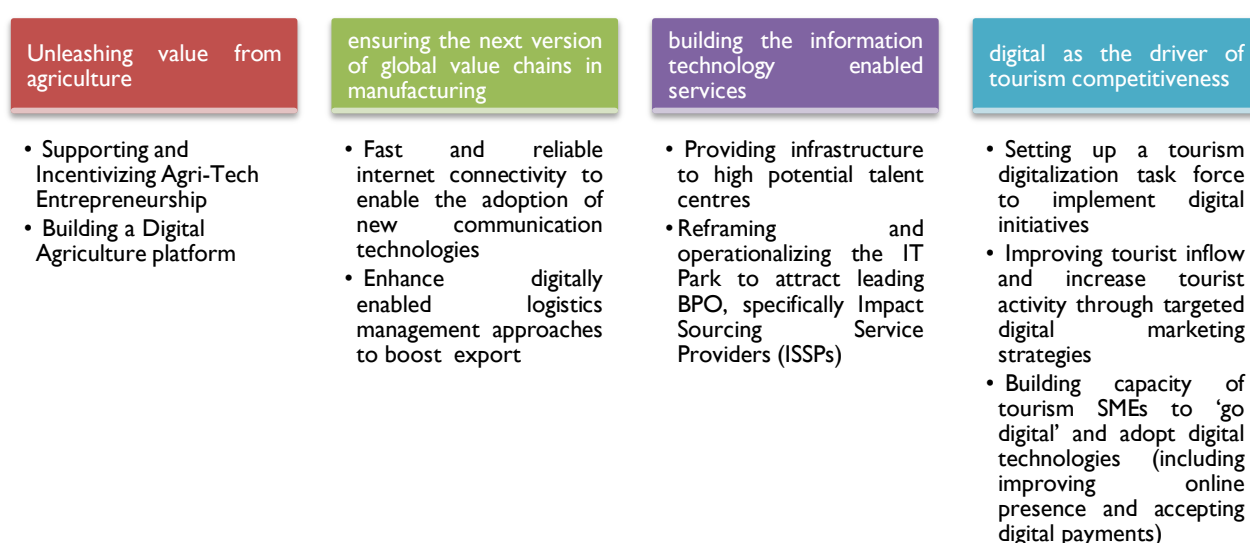


Source: Authors compilation based on MiNT (2020)

To achieve the objectives of the Digital Ethiopia 2025, key underlying factors identified are: 1) Enabling environment (Digital IDs, Digital Payment: mobile money already allowed and Cyber Security); 2) Digital Interactions among Government, Private Sector and Citizens (E-government/taxes and E-commerce); 3) Broader Issues (Finance/monetary policies, Human Resource: ICT Policy and Strategy for Higher Education and TVET in Ethiopia: Digital Skills Action Plan 2030 (MoSHE); and Policy and Regulation

In comport with the country's Ten-Year Perspective Plan, the Digital Ethiopia 2025 outlines for pathways: 1) Unleashing value from agriculture (such as Internet of Things/IOT, block chain, digital platform); 2) The next version of global value chains in manufacturing (such as Robotics, logistic technology); 3) Building the IT enabled services (IT infrastructure- Datacenter, broadband connectivity with redundancy, power/UPS, AI); and 4) Digital as the driver of tourism competitiveness (Internet connectivity, Digital Marketing, Mobiles Apps). Figure 6 provides more details on the pathways of Digital Ethiopia 2025 and each pathway is discussed briefly below.

Figure 6: Digital Ethiopia 2025 Pathways



Source: Authors compilation based on MiNT (2020)

Unleashing value from agriculture: Agriculture plays a predominant role in the Ethiopia economy (see for example, NBE, 2020). The sector account for 32.7% of the GDP, 82% of export revenue and 60% of Ethiopia's workforce. Digital technologies, such as internet of things allow farmers to monitor their production. Blockchain allows Fair Trade labels, traceability, and better/cheaper payment mechanisms to be implemented. Moreover, agricultural digital technologies such services for farm productivity (e.g., virtual extension services on pesticide usage, crop rotation, or localized weather forecast), market information services (such as price information), and financial services (providing farmers with access to credit) are presumed to play a pivotal to ensure sustainable growth in agriculture (MiNT, 2020). Hence, digital technologies are vital to improve agricultural productivity.

The strategic plan identified two opportunities to ensure the broad goal of this pathway. The first is building a digital agriculture platform as most goals related with agriculture

sector (such as enhancing productivity of smallholder farmers, developing legal framework such as land use right, modernize livestock production, and establishing strong linkage and effective commercial value chain) requires digital technologies. For building digital agricultural platform, various institutions, research centers, and innovative centers play a vital role. As a result, the government has established Ethiopian Biotechnology Institute (EBTI), Technology and Innovation Institute (TechIN), and Artificial Intelligence Research and Development Center. The existing Ministry of innovation, technology (MiNT) and the Ministry of Science and Higher Education (MoSHE) are also crucial stakeholders. For example, the Artificial Intelligence Research and Development Center focus on research, talent development, skills and educations, ethics and inclusion, standards and regulations. Strengthening digital agriculture is critically to support the transformation of the agriculture sector. However, this requires strong collaboration among all stakeholders across the agriculture value-chain. Secondly, supporting and incentivizing agri-tech entrepreneurship is presumed to transform the agriculture sector in terms of jobs creation, export revenue and inclusivity. In particular, the MiNT expected to play a leading role in ensuring ag-tech entrepreneurship.

Ensuring the next version of global value chains in manufacturing sector: Despite being a priority focus in the last decade, the manufacturing sector is far from being an engine of growth and structural change (Uqubay, 2018). The manufacturing sectors continues to be the centre of transformation for the Ethiopia economy and is considered a highly relevant pathway for achieving an inclusive digital economy. Two opportunities identified to realize digital transformation in the manufacturing sector are enabling the adoption and creation of new communication technologies in industrial parks to expand access to global markets and enhancing digitally enabled logistics management approaches to boost export.

The digital transformation strategy recognized the importance of new forms of communication technologies for the manufacturing industry. The strategy highlighted the importance of fixed telepresence conferencing, mobile telepresence robots, and virtual reality for the manufacturing industries. Hence, fast and reliable internet services increasingly important to adopt new forms of communication technologies that is decisive for Ethiopian manufacturing global value chain. For instance, digital connectivity is highly required for sustained competitiveness of the manufacturing sector, mainly for exporting.

New digital technologies could also provide opportunities for Ethiopia to modernize trade logistics and boosting exports. Ethiopia has among least efficient trade logistic system in the world even by the standard of Sub-Saharan Africa. For instance, transporting 20ft container of garments from Ethiopia to Germany estimated to costs 247% more than from Vietnam and 72% more than from Bangladesh. The world bank doing business report (2020) indicates that, Ethiopia scored 2.37 in the World Bank's Logistics Performance Index in 2016, make the country one of the least efficient in terms of trading across borders (ranked 156 out of 190 countries), even significantly lower than neighbouring Uganda (World Bank, 2020).

To overcome this challenge, the government has accorded critical attention to enhance digitally enabled management approaches to boost manufacturing export. This is also presumed to boost e-commerce in the country.

Building the information technology enabled services: This is the third pathway through which Ethiopia aims to realize the digital transformation. It mainly consists of IT-enabled services and IT services. IT services consist mainly of application development, programming, IT infrastructure services and maintenance. Development of IT services provides great opportunity for online workforce.

Two specific opportunities have been outlined in this pathway. The first one is the provision of infrastructure to high potential talent centres. Among others, facilitating cluster work, and infrastructure investment at selected universities is critical to nurture online work. The second one is reframing and operationalizing the IT Park to attract leading Business Process Outsourcing (BPO). In particular, due emphasis has been given for attracting ISSPs which is central to develop outbound BPO sector in the country.

Digital as the Driver of Tourism Competitiveness: Tourism has been selected among the priority sector in the Ten-Year Perspective Plan for its importance in the economy through its direct, indirect or induced economic impacts. Ethiopia is endowed with rich natural, historical, archaeological and cultural heritages rendering it a high tourism potential. However, the tourism sector in Ethiopia remains underdeveloped. One key shortfall in the tourism sector among many is the lack of digital platform and poor management of tourism data. Specifically, limited and poor-quality internet services in the remote areas, low penetration of digital payments, ATMS and Point of Sale, lack of

standardize data framework across various stakeholders, ineffective digital marketing and lack of adequate digital skills of tourism employees.

Digitalization can significantly support competitiveness as well as value chain of the sector. Three key interventions have been identified to drive digitalization across the tourism sector in digital strategy. Firstly, setting up a tourism digitalization task force to implement digital initiatives. This requires multi-stakeholder approach with clearly define role for each stakeholder to implement the initiative, formulation of policies and regulations that promote digitalization of the tourism sector. Secondly, developing targeted digital marketing strategies to improve tourist arrivals. In particular, leveraging social media, search engine optimization, and other promotional techniques can be implemented to improve the country tourism image. At last, building capacity of small and micro enterprise of tourism sector has been taken as one mechanism to digitalize the sector. Mainly, improving usage and adoption of digital technologies through training and workshops plays its role in improving capacity of small and micro enterprises.

D) National ICT Policy for Higher Education and TVET (2020)

The Ministry of Science and Higher Education (MoSHE) has prepared the National ICT Policy for Higher Education and TVET in 2020 (MoSHE, 2020). Some of the key objectives of the policy include 1) enhancing research and innovation in ICT products, applications, and services; 2) improving ICT governance and ecosystem in Ethiopian HE and TVET institutions; 3) develop the digital skills of students and build a community with shared resources based on open access scheme and open data; and 4) improve efficiency and effectiveness of the education and training systems for effective use and creation of digital technology. The policy has provisions for ICT- supported educational access, quality, equity and relevance; developing digital literacy and ICT competencies; research and innovation in ICT; ICT infrastructure in educational establishments; artificial intelligence; and policy and legal framework for ICT use among others. While implementation of the policy is unlikely to be smooth, it is a good starting point towards implementation of the Digital Ethiopia 2025.

2.2.3 Current ICT related Challenges and Uncertainties

- Digital transformation cannot be achieved by government only. Hence, a need for an incentive and support system for the private sector to engage in the digital economy. Currently, private ICT start-ups require support from the government.
- Electric power is crucial for the digital economy. Uninterrupted power supply will be crucial for ICT supported sectors. Currently, power outages result insignificant delays in ICT-supported services negatively affecting consumer confidence.
- Currently, the education and training system doesn't embed ICT to the desired extent. Implementation of the ICT policy for Higher Education and TVET is presumed to alleviate this problem.
- Currently finance and insurance is only allowed for domestic investors. This reduces potential technology and knowledge diffusion in Fintech. Moreover, restrictive monetary policy in Ethiopia makes it very difficult to make transitions abroad which can negatively affect international e-commerce.
- Lack of regulations in relation electronic transaction and private data protection will negatively affect the growth of the digital economy. There is an urgent need to prepare regulations and proclamations for electronic transactions and private data protection.

3. China Digital Policies: Lessons for Ethiopia

3.1 China's Digital Transformation

China has built a leading digital economy. Rapid digitalization, digital economy contribution surged from 15% of GDP in 2008 to 33% in 2017 (Zhang and Chen, 2019). The contribution of digital economy to GDP growth in China remained above 50% from 2014 to 2019. The digital economy contributed 67.7% of China's economic growth in 2019 and hence has become a key driving force China's growth and transformation (CAICT, 2020).

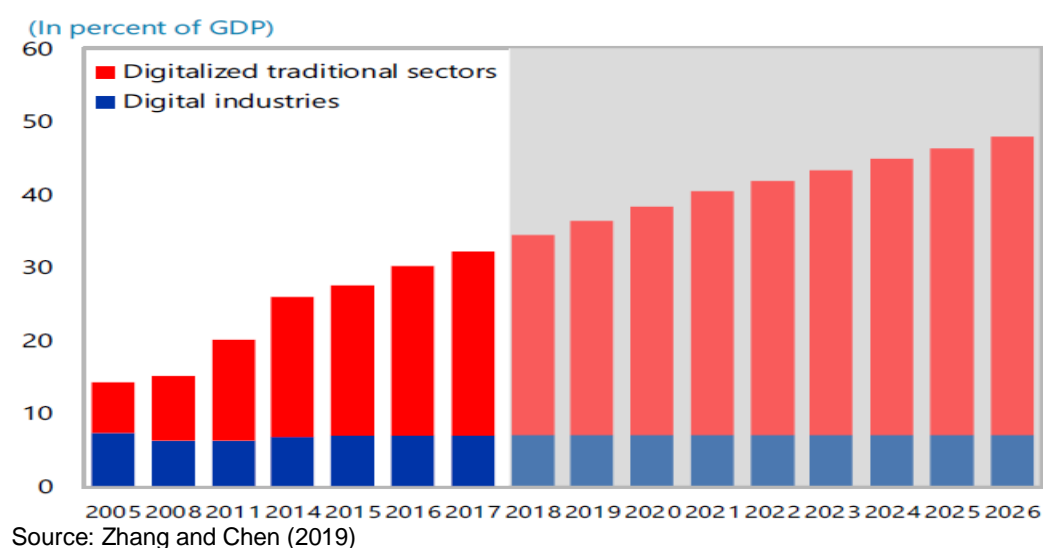
China is the leading country in term of B2C E-commerce market, globally as recorded more than 20% annually.³ The size of digitalized traditional sectors (e.g., financial and

³ Melton, J., Nolan, J., Chu, F., Bloomberg News, Bloomberg News, ...
Bloomberg News. (2019, January 24). Retrieved from

entertainment sectors increasingly use ICT in service provision, while industrial production increasingly uses robotics) has expanded from 10 percent of GDP in 2008 to 25 percent in 2017. Moreover, digitalization varies across sectors, with service sector the most digitalized (ICT contributing to 33% of the sector's value added in 2017) (Zhang and Chen, 2019). Moreover, China's digital economy is not only one of the largest by sheet size, but also has become competitive globally. For instance, in 2019, China conducted an estimated \$1.5 trillion of online retail transaction, account for 25% of the country's total retail transactions (more than twice of e-commerce in the USA, both in terms of volume and proportion) (Foote and Atkinson, 2020).

China has promoted digital economy as a national strategy which has contributed to its success. ICT has been integrated into China's social and economic development plans. Another key factor of the surge in China digital economy development is integration of ICT with traditional sectors (Zhang and Chen, 2019). As shown in Figure 7, the key driver of China's digital transformation lies in the digitalization of traditional sectors. Digitalization resulted in productivity growth, mainly through lower transaction costs, reduced information asymmetry and better matched demand and supply, and enhanced production efficiency (Zhang and Chen, 2019). Moreover, Digitalization has been a net employment creator for China as the number of jobs created surpasses the number of jobs lost. Similarly, average wages for ICT jobs have increased (Zhang and Chen, 2019). Hence, digitalization has been a strong force in creating decent and productive jobs in China.

Figure 7: China's Digitalization estimates



3.2 An Overview of China Digital Policies

3.2.1 Policies and Strategies for the Digital Economy

China has promoted digital economy as a national strategy which has contributed to its success. ICT has been integrated into China's social and economic development plans. Table 3 reports the key policies and strategy that have driven China's digital transformation.

National Informatization Strategy (2006-2020)⁴: In 2006, the Chinese government published the National Informatization Strategy: 2006-2020. The strategy-underscored informatization is an integral portion of China's national strategy for moving toward modernization. In particular, the strategy aimed to play a significant role to China's economic and social development (Qiang, 2007). The core aspects of the strategy include promoting informatization of the national economy; promoting e-government; creating an advanced Internet culture; advancing informatization in sectors such as education, health care, and public safety; expanding information infrastructures (e.g., wireline broadband and 3G/4G wireless networks); exploiting information resources more efficiently; improving the global competitiveness of the Chinese ICT industry; building national information security systems; and improving people's ability to use information technology (Atkinson, 2014).

Table 2: China's Key Digital Policies and Strategies

Policy/strategy	Year of publication	Aim of the policy/strategy
National Informatization Strategy: 2006-2020	2006	<p>Policy Commitment and Awareness</p> <ul style="list-style-type: none"> Underscored informatization as an integral part of China's modernization Aimed to play a significant role to China's economic and social development
Broadband China Strategy	2013	<p>Improving access</p> <ul style="list-style-type: none"> aims to improve internet speed, coverage, and services across the country through targeted infrastructure investments
Internet Plus	2015	<p>Digital Integration</p> <ul style="list-style-type: none"> Emphasize on integrating AI, big data, cloud into the "real economy" via the Internet of Things (IoT). Focus on online to offline (O2O) (i.e., ecommerce, ride hailing, food ordering) to unlock "hidden productivity of the conventional economy"
Five-Year Plan for Informatization (2016–2020)	2016	<p>Enhanced Integration with targeted Investment on data and equipment</p>

⁴ Informatization refer to development of ICT industry as well as adoption of ICT in society and the economy (see Atkinson, 2014. ICT Innovation Policy in China: A Review. ITIF).

		<ul style="list-style-type: none"> • Aims for China to “No longer be restrained by others [i.e., foreign industry/governments] for core technologies in strategically competitive fields” • Identifies major projects slated for increased state support in “core electronic equipment, high-end general-purpose chips, basic software, large-scale IC, next-generation wireless broadband mobile communication, quantum communication and quantum computing.” • Targeted to build a “National Data Resource” system to enhance coordination of data
Five-Year Plan for Science & Technology Innovation (2016-2020)	2016	<p>Continued and Sustained Growth</p> <ul style="list-style-type: none"> • Sets R&D spending targets and calls for breakthroughs in next-generation ICT like cloud and big data • Support Chinese firms to set up overseas R&D centers while encouraging foreign firms and research institutions to set up high-end R&D centers for technology transfer
13 th Five Year National Strategic Emerging Industries Development Plan	2016	<p>Integration of the next generation ICT</p> <ul style="list-style-type: none"> • Developments in next generation ICT (AI, cloud, big data, IoT) as source of growth and “symbol of national strength”
Belt and Road Initiative and Information Silk Road	2015	<p>Digital Integration with the rest of the world</p> <ul style="list-style-type: none"> • Calls for promotion of ecommerce, smart cities, and digital trade with Asia, Europe, and Africa, with expansion of connectivity and communication networks

Source: Authors compilation based on various sources⁵

Aside from long-term and mid-term policy, the Chinese government has designed industry specific development policies. For instance, the STATE COUNCIL of China issued ‘Circular on policies for the development of software and IC industries’ in 2000. The policies mainly include investment, financing, taxation, industrial technology, export, income distribution, training, government procurement, and intellectual property to support China’s software and ICT development⁶. China’s ICT strategy mainly targeted to development of indigenous ICT technologies and industries (Atkinson, 2014). In particular, China ICT technologies focused on Cloud Computing, the Internet of Things (IOT) and data innovation.

Chinese government has made a new round of reform and innovation policy in ICT to continue the development of the ICT sector. For instance, in 2013, the Chinese government took important reforms to allow the market play a more decisive role in resource allocation (Atkinson, 2014). One of the reform areas was the ICT field, where Virtual Network Operators (VNO) are required to rent telecom network facilities from the

⁵ Such as Center for Strategic and International Studies (CSIS) National Policy: Beijing’s Vision for Internet. Technology and the Digital Economy

⁶ “State Council on Issuing Several Policies to encourage the software industry and integrated circuit industry development,” last modified June 24, 2000, The Consulate General of the People’s Republic of China in Los Angeles, <http://losangeles.china-consulate.org/chn/tech/policy/t27574.htm>.

incumbents to provide their own services. Another loosened policy measure was cancelation of permits on telecom service price plans. Further, the Shanghai Free Trade Zone was established along with adoption of new special administrative measure (negative list⁷) which allow foreign investor to run any business in the zone. Furthermore, the reform encourages the private sector to invest in utility and infrastructure such as transportation, ICT, and energy (see Atkinson, 2014).

Broadband China Strategy of 2013: When this strategy launched, there was a wide gap between China and developed countries in broadband development. Further, Urban-rural and regional gaps in broadband development were widening thereby severely hampering the economic development. To overcome this challenge, the STATE COUNCIL issued the implementation of “Broadland China strategy to drive strategy to drive all-round broadband advancement, speed up broadband construction, convergent and build safe and universal next generation national information infrastructure”⁸. The main orientation of the strategy was to recognize Broadband China as national strategic public infrastructure. The strategic goal was to ensure Broadband development to social and economic development, and link up with the strategic plan of the information and telecommunication industry. In particular, the strategic goals included (See Figure 8 for targets):

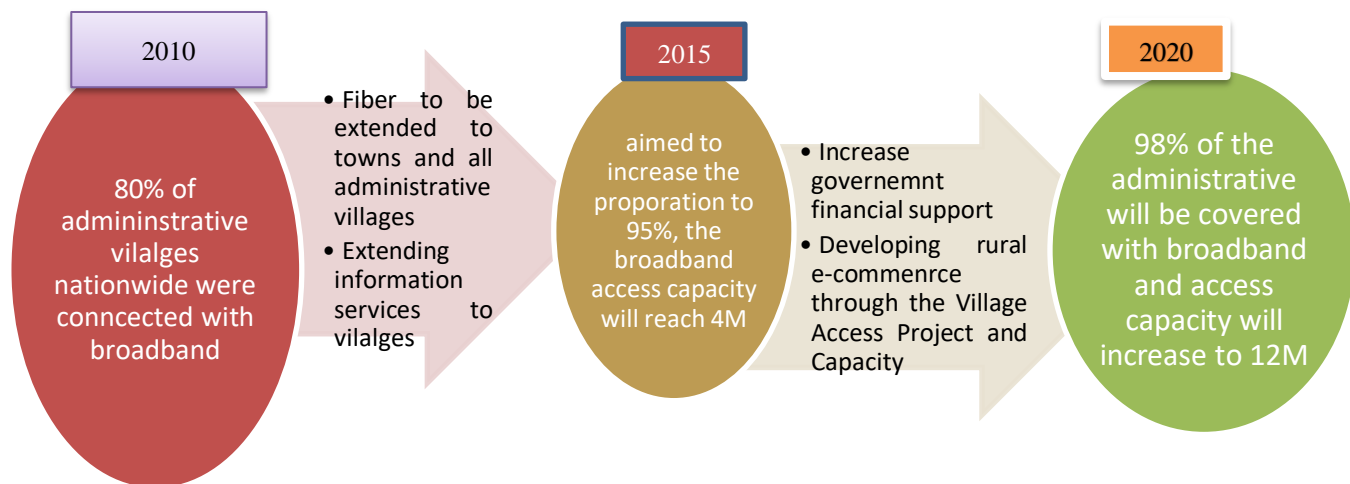
- Build the next generation information infrastructure;
- Realize FTTH coverage in cities and villages, and achieve 50% of fixed broadband penetration, 32.5% of 3G/LTE penetration and 95% of administrative villages access to broadband
- Broadband access capability in cities and rural areas respectively reaches to 20Mbps and 4Mbps
- The level of broadband applications will increase significantly, with a wide range of mobile Internet penetration.
- Narrowing the broadband network facilities with the developed countries in the long run
- The penetration rate of fixed broadband and 3G/LTE reaches to 70% and 85% respectively. Accordingly, 98% of administrative villages to have access to the broadband.

⁸ CAICT (2020). Broadband China Strategy and its Implementation

- Broadband access capability in cities and rural reaches to 50Mbps and 12Mbps respectively, and households in developed cities run up to 1Gbps
- Broadband applications deeply incorporated into people's lives and work, and mobile Internet achieve universal penetration

Universal service was established to support broadband development in the rural areas. The target was Telephone and Internet Access reaching Every Village and Township”, telephone service reaching every natural village, broadband access reaching every administrative village and rural information service were included into the scope of Universal Service.

Figure 8: Targets of Broadband China Strategy



Source: CAICT, 2020

To achieve the strategic goals of the 'Broadband China', the Chinese government has taken various policy measures such as organizing structure and leadership, system environment, and broadband network construction mainly in the rural areas and backward regions.

Internet plus Policy (2015): China unveiled its Internet Plus action plan in 2015 with the aim of integrating the internet with the traditional industries and fuel economic growth⁹. As underlined by the Chinese government, internet, which supports a digital economy and heads a web-oriented commodity chain, is a new engine developed to leapfrog

⁹ Xinhua, published on July 04, 2015 @11:07 AM. China unveils Internet Plus action plan to fuel growth. Accessed online from this website: http://english.www.gov.cn/policies/latest_releases/2015/07/04/content_281475140165588.htm

China's economy forward. In particular, the internet plus action gave emphasis for promoting in-depth integration of internet innovation achievement with economic and social sectors in 11 fields, including mass entrepreneurship and innovation, manufacturing, agriculture, energy, finance, public services, logistics, e-commerce, traffic, biology and artificial intelligence, to ensure productivity and innovation in the real economy (CAICT, 2020). Accordingly, by 2025, the internet plus action would become *"a new economic model and an important driving force for economic and social innovation and development"*¹⁰. According to action plan enterprises would receive government support to set up platforms and weaving networks for innovation. In addition, the government targeted to establish industrial standards for the integration of internet and industries.

To realize the targets, China cleared barriers and lower limits for the market entry of Internet Plus-related products, optimize the credit system, draft a strategy and promote legal services. In particular, train and use of local and foreign talent has received critical attention to meet the need of the Internet Plus development. Moreover, the government aimed to provide financial support and tax references to key projects to achieve the goal of action plan.

Five-Year Plan for Science & Technology Innovation (2016-2020): The Chinese government launched the 'Five-year Plan for Science and Technology Innovation' in 2016 with the objectives of¹¹:

- All-inclusive increase in independent innovation capabilities: In particular, "Increase the intensity of investments in research and experimental development funding to 2.5%, significantly increase the share of basic research in nationwide R&D investments, and increase the proportion of R&D expenditures by industrial enterprises above a certain size to 1.1% of main business revenue. Further, aimed to raise China to 2nd in the world in terms of scientific and technological paper citations; and increase the number of invention patents per 10,000 people to 12."
- Enhancement of the support and leadership roles played by scientific and technological innovation. Particularly, let scientific and technological innovation to

¹⁰ Xinhua, published on July 04, 2015 @11:07 AM. China unveils Internet Plus action plan to fuel growth

¹¹ See this website: PRC State Council (2016). Translated by Center for Security and Emerging Technology (CSET, 2020). <https://cset.georgetown.edu/publication/state-council-notice-on-the-publication-of-the-national-13th-five-year-plan-for-st-innovation/>

play a more profound role in promoting economic balance, inclusiveness, and sustainable development. Targeted to increase the contribution rate of scientific and technological progress to economic development to 60% and raise the added value of the knowledge-intensive service industry to 20% of GDP, and increase the total amount of national technology contracts to RMB2 trillion.

- Advance the scale and quality of innovative talent. Foster the emergence of a group of strategic scientific and technological talent, leading scientific and technological talent, innovative entrepreneurs, and highly skilled talent, further expand the team of young scientific and technological talent, significantly improve the human resource structure and employment structure, and raise the number of R&D personnel to 60 per 10,000 employees.
- Mature and shape institutions and mechanisms conducive to innovation. Basically, form the basic system and policy structure of science and technology innovation, significantly enhance the rule of law in science and technology innovation management, and achieve significant progress in the construction of innovation governance capacity. Enhance the robustness of market-oriented technology innovation systems with enterprises as the primary entities, make the governance structure and development mechanisms of higher education institutions and research institutes more scientific, improve mechanisms for military-civil fusion innovation, and significantly improve the overall efficiency of the national innovation system.

13th Five Year Plan for Strategic Emerging Industries (2016-2020): In 2016, the Chinese State Council issued the National 13th Five Year Plan for the Development of Strategic Emerging Industries, with the objective to direct and support the development of the seven strategic emerging industries¹². The plan aimed to improve contribution of industrial value added of strategic emerging industries to Chinese economy, emerging industries expected to account for 15% of China's GDP by 2020. In addition, at the end of strategic plan, the total output value of the new-generation information technology industry projected to exceed RMB 12 trillion. Further, the indicated that the output value of the digital creativity industry projected to reach RMB 8 trillion by 2020.

For realization of the strategic plan, the state council underscored the importance of providing financial support to qualified strategic emerging enterprises. In particular, the emerging industries targeted to receive financing directly from the capital market. In

¹² The industries consisting of energy-saving and environmental protection industry, the new-generation information technology industry, the biology industry, the high-end equipment manufacturing industry, the new energy industry, the new materials industry, and the new-energy automobile industry.

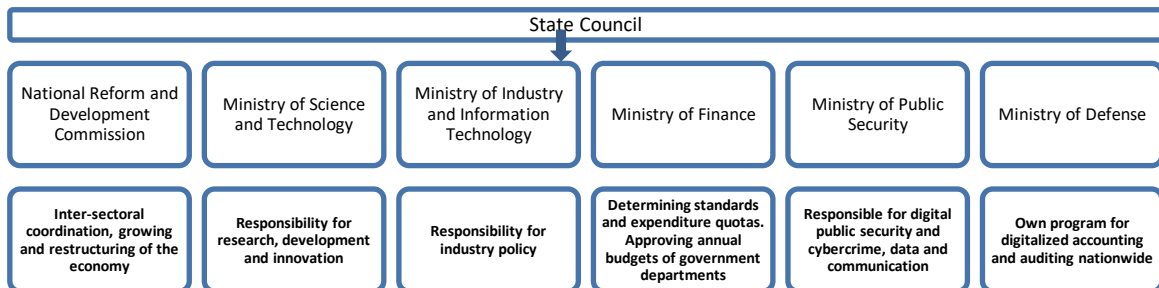
addition, the plan highlighted the significance of encouraging financial institutions to ensure sufficient finance for the targets sectors. For instance, establishing a national financing guarantee fund and provision of tax incentive to encourage investment into the emerging sectors.

3.2.2 Coordination and Implementation

In order to implement effectively various policies and strategies, China has established state council to improve coordination among responsible bodies. The state council includes National Reform and Development Commission (responsible for inter-sectoral coordination, growing and restructuring of the economy), Ministry of Science and Technology (responsibility for research, development and innovation), and Ministry of Industry and Information Technology (design and implement industrial policy). Further, Ministry of Finance, Ministry of Public Security (responsible for digital public security and cybercrime, data and communication) and Ministry of Defence (own program for digitalized accounting and auditing nationwide), are also part of the state council¹³.

Hence, one of the key successes of China's digital transformation lies in effective implementation with functional coordination system.

Figure 9: Coordination System



Source: Shi-Kupfer and Ohlberg (2019).

¹³ Mercator Institute for China Studies. <https://merics.org/en/report/chinas-digital-rise#:~:text=China's%20digital%20strategy%20covers%20its,broader%20normative%20and%20security%20goals.>

3.3 China's Digital Policies: A Summary of Key Lessons for Ethiopia

The key lessons for Ethiopia from China digital economy success are summarised below.

- **Significant digital infrastructure investment:** Digital infrastructure development is a core driver of digital penetration rate. In this regard, China registered remarkable achievement. This includes massive broadband connectivity/network expansion, notably in the rural areas and backward regions which helped China achieve high mobile penetration rates. The telecom industry has been a key priority area for the government of China as it plays a key supporting role for the digital economy. Investment in electronic equipment and software developments has been on the rise. Supportive environment for the electronic and communications industries is another key factor (CAICT, 2020).
 - **Data Management:** China has formed a relatively complete data supply chain, shaping a data industry system in various links such as data acquisition, data annotations, time-series database management, and data storage (See, for example, CAICT, 2020). Capability to manage and analyse data has been increased. One shortfall in this regard is the issue of data pricing as it remains at its infancy in China. Regulations about data exchange and pricing remain limited to some regions in China. Moreover, China's has restrictive cross-border data flow regulations via security, internet access, and control and financial flows and services. For example, China requires banks and insurers to localize data under its data localization requirements based on its cybersecurity law (Meltzer, 2020). For countries such as Ethiopia with weaker digital security infrastructure, such as laws could be important for data protection.
 - **Improved digital governance capability:** the legislative level of digital economy has significantly improved. Mainly, series national laws, including the cybersecurity law, law against unfair competition, and e-commerce introduced and revised, providing a legal basis for digital governance. Improving the cybersecurity protection reduce public data privacy concern. Moreover, China's has accelerated the construction of digital government from the central to local levels.
 - **Enabling regulations for digital investment (light touch regulation):** Chinese has implemented an enabling regulation at early years of fintech development. Reducing barriers and lower limits for the market entry of Internet Plus-related products has help the boom in digital industries. Currently, China has one of the
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most dynamic digital investment and start-up ecosystems in the world (Woetzel et al.,2017). Growing investment in digital technologies such as big data, artificial intelligence (AI), and financial technology (fintech) companies has been the hallmark of China venture capital investment. China approach has been Light-touch—or, more accurately, late—regulation of digital activities and players which encouraged entrepreneurship and experimentation rather than restrictive or controlling (Woetzel et al.,2017). For example, as the response of regulators lagged behind market developments, China's internet companies had an opportunity freely test and commercialize products and services and to gain threshold market.

- **Strong Coordination:** In order to implement effectively various policies and strategies, China has established the State Council to improve coordination among responsible bodies. The State Council includes National Reform and Development Commission (responsible for inter-sectoral coordination, growing and restructuring of the economy), Ministry of Science and Technology (responsibility for research, development and innovation), and Ministry of Industry and Information Technology (design and implement industrial policy). Further, Ministry of Finance, Ministry of Public Security (responsible for digital public security and cybercrime, data and communication) and Ministry of Defence (own program for digitalized accounting and auditing nationwide), are also part of the state council. Hence, one of the key successes of China's digital transformation lies in effective implementation with functional coordination system.
 - **Digital Security:** The 2017 first cybersecurity law provisions for the protection of personal information, security requirements for network operators, and restrictions on personal and business data transfer. While China followed a light-touch regulation at early stage, it started to tight regulation as its digital environment become more developed (Woetzel et al.,2017).
 - **The importance of effective digital collaboration among Firms:** Three models for collaboration have been identified in China, Data sharing Model, Coalition-Building Model and Superapp Platform Model (See, for example, Prashantham and Woetzel, 2020). The core idea behind Data sharing model is creating shared value by adopting a more horizontal digitally enabled data architecture. In the context of China, a more digitally native business platform enables horizontally lined companies for easier data sharing. China growing digital economy has seen the rise of ecosystem giants, noticeably Alibaba and
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Tencent, forefront of creating ecosystem value. For instance, Alibaba allows lesser known Small and Micro Enterprise similar to share data in hybrid online/offline supermarkets. In doing so, the Alibaba takes a commission on everything that passes through its network without competing with ecosystem participants, unlike most of western countries approach. For instance, Amazon takes ownership of inventory and often competes with its ecosystem partners (Prashantham and Woetzel, 2020).

- **Special focus for e-commerce and mobile payment:** Conscious and successive policies and strategies have been implemented by China to develop its e-commerce which has contributed to its glaring success and made it an e-commerce hub. China's relatively undeveloped infrastructure created an opportunity for e-commerce to make thrive. Some of the key interventions include the following.
 - Adoption of a series of five-year plans focused on E-Commerce
 - Support for the sector led to investments and emergence of national champions such as Alibaba leading to greater adoption.
 - The government encouraged investments in logistics by providing concessional land leases to set up warehouses and created free trade zones to encourage cross-border E-Commerce. The Hangzhou free trade zone is accompanied by adoption of integrated online systems which has led to faster processing and clearing of customs. Several such zone set up
 - Forums to regularly engage with the industry and policy measures to drive digital payments have further aided its growth. The success of digital payments such as Alipay that also uses QR method for offline shopping in supermarkets, restaurants has revolutionised e-commerce in China.
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4. Concluding Remarks

In the last two decades Ethiopia has registered remarkable economic growth and considerable poverty reduction. However, despite structural transformation being the focus of government policies over the last decade, achievements have been less than hoped. Hence, productivity and competitiveness of the Ethiopian economy has remained low.

One potential enabling factor for enhancing productivity and competitiveness is the digital economy. China's success in integrating the traditional economic system with ICT was instrumental in boosting China's productivity. While the digital economy is nascent in Ethiopia, if guided by appropriate policies and strategies it has an immense potential as a crucial sector on its own and as an essential enabler and catalysing factor in triggering productivity in the rest of the economy.

In recent years, the Government of Ethiopia has identified the digital economy as a priority area. The notable strategies, regulations, and programs for the digital economy recently prepared are the Communication Services Proclamation of 2019, the Digital Ethiopia 2025 of the Ministry of Innovation and Technology (MiNT), the National ICT Policy for Higher Education and TVET (MoSHE), and the Start-up and Innovation Business Act.

A review of China experience in digital economy reveals several lessons for Ethiopia. Some of the key lessons include the following:

- The need for a significant digital infrastructure investment.
 - Prudent Data Management system and data protection (China requires banks and insurers to localize data under its data localization requirements based on its cybersecurity law). Similar approaches can be followed in Ethiopia until proper data protection laws and enforcement matures.
 - The need for improved digital governance capability: A series national laws, including the cybersecurity law, law against unfair competition, and e-commerce providing a legal basis for digital governance and improving the cyber-security protection that can enhance public confidence in the digital economy.
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- Enabling regulations for digital investment (light-touch regulation): Reducing barriers and lowering limits for the market entry of digital economy actors is crucial for its development.
 - Strong Coordination: In order to implement effectively various policies and strategies, China has established the State Council to improve coordination among responsible bodies. Similar bodies in Ethiopia can improve coordination in the digital economy.
 - Digital Security with provisions for the protection of personal information, security requirements for network operators, and restrictions on personal and business data transfer will be crucial for the digital economy to take off in Ethiopia.
 - Special focus for e-commerce and mobile payment: Conscious and successive policies and strategies needed to develop e-commerce in Ethiopia. Ethiopia like China has a big domestic market with ample opportunity for e-commerce.
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5. Reference

- Atkinson, 2014. ICT Innovation Policy in China: A Review. ITIF
- CAICT (2020) DIGITAL ECONOMY DEVELOPMENT IN CHINA, China Academy of Telecommunications Technology
- FDRE (2016) The National Information and Communication Technology (ICT) Policy and Strategy, Federal Democratic Republic of Ethiopia
- Footnote and Atkinson (2020). Chinese Competitiveness in the International Digital Economy. Information Technology and Innovation Foundation (ITIF).
- Gebreeyesus, M. (2013). "Industrial Policy and Development in Ethiopia: Evolution and Present Experimentation," *WIDER Working Paper*, No. 2013/125.
- Meltezer, J. P. (2020). China's digital services trade and data governance: How should the United States respond. Erişim Adresi: <https://www.brookings.edu/articles/chinas-digital-services-trade-and-data-governance-how-should-the-united-states-respond>, 15, 2020.
- Melton, J., Nolan, J., Chu, F., Bloomberg News, Bloomberg News, ... from Bloomberg News. (2019, January 24). Retrieved from <https://www.digitalcommerce360.com/2019/01/24/chinas-online-sales-grew-almost-24-in-2018/>
- Mercator Institute for China Studies. <https://merics.org/en/report/chinas-digital-rise#:~:text=China's%20digital%20strategy%20covers%20its,broader%20normative%20and%20security%20goals>.
- MINT (2020). Digital Ethiopia 2025 – A Strategy For Ethiopia Inclusive Prosperity, Ministry of Innovation and Technology, Ethiopia
- MoFED (2002) Ethiopia: Sustainable Development and Poverty Reduction Program. Federal Democratic Republic of Ethiopia Ministry of Finance and Economic Development. Addis Ababa.
- MoFED (2005) Plan for Accelerated and Sustained Development to End Poverty (PASDEP). Federal Democratic Republic of Ethiopia Ministry of Finance and Economic Development Addis Ababa.
- MoFED (2010) Growth and Transformation Plan (GTP). Federal Democratic Republic of Ethiopia Ministry of Finance and Economic Development. Addis Ababa. MoSHE (2020) National ICT Policy for Higher Education and TVET in 2020, Ministry of Science and Higher Education, Ethiopia
- NBE (2020). Annual Report 2018/19, the National Bank of Ethiopia, Addis Ababa.
- NPC (2016). Growth and Transformation Plan (GTP). Federal Democratic Republic of Ethiopia National Planning Commission. Addis Ababa.
- Office of the Prime Minister (2019). A Homegrown Economic Reform Agenda: A Pathway to Prosperity, The FDRE Office of the Prime Minister, Addis Ababa.
- Oqubay A. (2018). The Structure and Performance of the Ethiopian Manufacturing Sector, Working Paper Series N° 299, African Development Bank, Abidjan, Côte d'Ivoire.
- Prashantham and Woetzel (August 10, 2020). 3 Lessons from Chinese Firms on Effective Digital Collaboration.

- PRC State Council (2016). Translated by Center for Security and Emerging Technology (CSET, 2020). <https://cset.georgetown.edu/publication/state-council-notice-on-the-publication-of-the-national-13th-five-year-plan-for-st-innovation/>
- Qiang, Christine Zhen-Wei (2007). China's information revolution: managing the economic and social transformation. The International Bank for Reconstruction and Development / The World Bank
- Shi-Kupfer, K., & Ohlberg, M. (2019). China's Digital Rise: Challenges for Europe'. MERICS Papers on China, 7, 14.
- ITU (2021) ICT Development Index , the International Telecommunications Union, Geneva Switzerland
- Woetzel, J., Seong, J., Wang, K. W., Manvika, J., Chui, M., & Wong, W. (2017). Digital China: Powering the economy to global competitiveness. McKinsey Global Institute, 17.
- World Bank (2020), Economy Profile of Ethiopia, Doing Business 2020 Indicators
- Xinhua, published on July 04, 2015 @11.07 AM. China unveils Internet Plus action plan to fuel growth. Accessed online from this website: http://english.www.gov.cn/policies/latest_releases/2015/07/04/content_281475140165588.htm
- Zhang, M. L., & Chen, M. S. (2019). China's digital economy: Opportunities and risks. International Monetary Fund.
-