

Potential of ICT Industry for Economic Growth in Developing Countries: A Case Study of the Republic of Rwanda

Petra Maresova and Mundere Leandre
Faculty of Informatics and Management, Universty of Hradec Kralove, Rokitanskeho 62,
Hradec Kralove 3, 50003 Czech Republic

Abstract: Information and Communication Technologies (ICTs) are becoming a global necessity to achieve milestones in a smarter and accurate way. The speed at which countries are developing is often associated to how they invest in science and technology. It is almost now impossible to expect a growth in the way citizens live if the governments do not think on new ways of fastening the flow of information, it's control and the way it is distributed to citizens. The aim of this research is how those countries can benefit from ICTs as a strong pillar to take their economies to a next level. Although, the case study is focused significantly on the Republic of Rwanda, the same approach can be used as well to other countries in the same range of economic classification, probably with slight changes according to the respective country of application. The used method is qualitative and quantitative approaches of the descriptive methodology, whereby the researcher based on data got from answered questions by the monitoring and evaluation teams of both MYICT and National Institute of Statistics of Rwanda (NISR) to assess the effectiveness of Information and communication technologies as a perfect tool for economic growth in Rwanda.

Key words: ICT industry, developing countries, Rwanda, case study, espective, application

INTRODUCTION

Developing countries, low income countries or third world countries are terms that have been used interchangeably since the Cold War. This term was referred to any country that was not aligned either to the NATO or the communist bloc. The researcher will use in the next sections of this thesis the term “developing countries” to avoid misinterpretation. Actually, there are many factors that are common in developing countries and these will be discussed deeply along the next chapters such as ICT availability, GDP, HDI and CPI. These last are also known as economic growth measures.

Developing countries are defined according to their GNI per capita. Countries with a GNI of 11.905 USD and less are defined as developing countries. Countries that are slightly over that amount will also be considered as developing for the year 2015 and their situation will be reviewed for 2016. This puts in total 147 countries in conditions of being developing country status (TWB., 2015).

ICTs are also defined as tools or techniques that allow recording, storing, using, diffusing and accessing electronic information (TWB., 2015). This thesis also

accepts more broadly that ICTs are ‘tools that facilitate communication and the processing and transmission of information and the sharing of knowledge by electronic means (UNNGLS., 2009).

In 1998, OECD member countries agreed to define the ICT industry as a combination of manufacturing and services industries that capture, transmit and display data and information electronically (OECD., 2002). The OECD’s 1998 activity-based definition of ICT was reviewed in April 2002. It was decided that, although this definition gives only a first approximation of the ICT sector, it should not be changed at this stage; rather its implementation should be improved with the help of more detailed national classification (ITU., 2002).

There is a direct relationship on how one can maximize the profitability of a country’s economic situation by designing strong ICT policies. In this research, ICT sector shall be understood as a combination of economic activities producing goods (technologies) and providing services, meant for information processing, communication and distribution in an electronic way, including their recording, transmitting and depicting (OECD., 2011).

Investing in ICT is a key driver of economic growth for emerging and developed markets. There is a

correlation between ICT readiness, availability of broadband, computers and software in a country-and competitiveness. Countries with the most advanced ICT sectors present the highest levels of competitiveness, suggesting that having a country enabled by ICT improves its overall economic performance in the long run.

The aim of this research is to analyzed how developing countries can benefit from ICTs as a strong pillar to take their economies to a next level. Although, the case study is focused significantly on the Republic of Rwanda, the same approach can be used as well to other countries in the same range of economic classification, probably with slight changes according to the respective country of application.

MATERIALS AND METHODS

The used method is qualitative and quantitative approaches of the descriptive methodology, whereby the author based on data got from answered questions by the monitoring and evaluation teams of both MYICT and National Institute of Statistics of Rwanda (NISR) to assess the effectiveness of information and communication technologies as a perfect tool for economic growth in Rwanda.

In order to develop a critical study, a questionnaire was distributed to other independent respondents who are keen on in the field of ICT, economy and third party as well. These come from different nationalities but, since, the study focuses a lot on developing countries, the most focus was on those who come in the same targeted field of research and country. The questionnaire was designed using SurveyMonkey, a web application that manages and analyzes online surveys. Since, the application is a commercial tool, it only allow a maximum of 10 questions. Despite this limitation, the research managed to touch all sensitive areas that served as a backbone of this research.

Potential of ICT sector and economy in Rwanda-case study: Rwanda is a landlocked country in the Central-East Africa with 26.338 km² of surface on which live 11,776.620 inhabitants (NISR., 2014). Rwanda is the world's 149th-largest country. Rwanda is a low income country, GNI per capita (USD): 560, GDP (PPP): USD16.937 billion (Total), USD1592 (Per capita), GNP (Nominal): USD7.769 billion (Total), USD730 (Per capita), HDI: 0.434, Currency: Rwandan Franc (RWF), Exchange rates: 1USD = 683.9RWF, 1 EUR = 857.3RWF (Prices are for "Buying" November 2014, Rwanda Central Bank). The national budget for the fiscal year 2015/2016 was evaluated to USD 2.9 billion, rising from USD 2.7 billion the previous year (MINECOFIN., 2014).

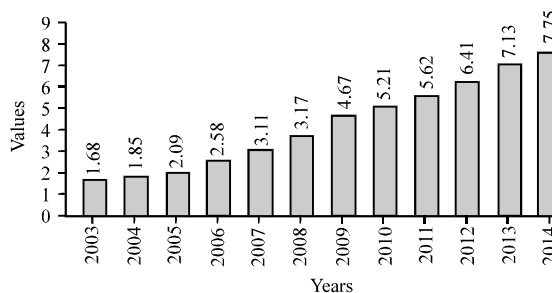


Fig. 1: Rwanda's progressive GDP growth

The Gross Domestic Product (GDP) is a measure of national income and output for a given country's economy. The GDP is equal to the total expenditures for all final goods and services produced within a country in a stipulated period of time. GDP in Rwanda was worth 7.13 billion US dollars in 2013 (Fig. 1). The GDP value of Rwanda represents 0.01% of the world economy. It averaged 1.79 USD billion from 1960 until 2013, reaching an all-time high of 7.45 USD billion in 2014 and a record low of 0.12 USD billion in 1961 (NISR., 2014).

Rwanda has always recorded a high female employment rate over the past ten years than in men category. Even though the difference is not so big, women are still have a bigger employment rate, since, 2000. This was 85.2 for females against 83.2% for males in 2012. The situation was the same in 200 where employment rate was 87.8 for female and 85.4% for male.

Technological environment: The ICT industry in Rwanda is a growing field, since, last 10 years. Policies which have been put in place give it a major target by the Rwandan government as a channel to drive other key sectors which are being implemented. The contribution of ICT to the overall country development is as well remarkable factor which must be taken into consideration. Despite a global economic recession resulting in an average global growth rate of 2.6%, Rwanda has managed to show the highest annual economic growth rate of 8.2% the last 3 years. This continuous growth has enabled in part by the government's aggressive investments in Information Communication Technology and the rapid expansion of the mobile telecommunication sector. Furthermore, being landlocked has made it imperative for Rwanda's continued development and investment in ICT (NICL., 2014).

Rwanda ICT national strategy: According to the Ministry of Youth and ICT, the national ICT strategy was redesigned into a special framework called "Smart Rwanda". The national strategy, ICT sector strategic plan 2013-2018 requires a review and reorientation aligned to the new initiatives of SMART ICT as defined in the Smart

Rwanda Conference held in June 2012. These efforts have as yielded a new national ICT strategy, the Smart Rwanda Master Plan (SRMP) replacing the ICT SSP. It is this SRMP that underpins the current national socio-economic development policies, strategy and provisions as well as ICT development, deployment and use in the country through a baseline study. The SRMP also identifies the progress made and the developmental challenges of the country and makes the case for accelerating the march towards a knowledge economy and society as a way of addressing these challenges. The Smart Rwanda Master Plan includes:

- Expansion of the mandate of the National ICT Steering Committee
- Establishment of a board that is representative of the key economic and social sectors and members from private sector
- Relocation of the SRMP governance and management responsibility to Rwanda Information Society Agency (RISA) from Rwanda Development Board where it is currently managed
- Re-assignment of the M and E function from RDB- MYICT
- Centralized management of government ICT under RISA to a drive common standards, infrastructure and capabilities strategy

RESULTS AND DISCUSSION

Rwanda's ICT SWOT analysis: In order to have a clear and a summary of the ICT sector, SWOT analysis was specified.

SWOT matrix of Rwandan ICT industry

STRENGTHS

- Strong political will in support of ICT
- Existence of national ICT policy
- ICT sector budget is on par with OECD countries at 1.6%, far above the African average
- The small size of the country would facilitate ICT network infrastructure
- Strong institutional organizations (RDB, RITA, RURA)
- ICT being the most attractive in terms of foreign investment
- e-Government and e-Governance

Weaknesses:

- Lack of necessary technical and professional level of human resources
- Insufficient of electricity which is a prerequisite to the ICT accessibility

- Inadequate financial resources
- High cost of communication in comparison with neighboring countries
- Lack of awareness about ICT and the benefits of e-Government in both urban and rural areas

OPPORTUNITIES

- Regional Communication Infrastructure Project (RCIP)
- 4G LTE connectivity available in Rwanda only in the region
- Kigali metropolitan network and wibro mobile WiMax technology
- Rwanda national backbone project
- National data center

Threats:

- Existence of strong competition in the region. Each EAC member is aiming to become in ICT hub
- Potential of ICT crimes and difficulties to control them
- The distance between houses is sometimes big which involves more investments in connecting them

Strengths: A combination of national commitment and license obligations imposed by governments is driving an accelerated rollout of telecommunications infrastructure. This is complemented by a competent (though far too small) existing skills base and the enthusiasm and desire amongst the youth of the developing countries to acquire ICT knowledge. Tight bonds and economical movements between neighboring nations is a good channel to connect slowly but powerful the while block in a short time and less investment.

Weaknesses: Large areas of some countries still have minimal ICT infrastructure and even with the falling cost of infrastructure many people cannot afford to participate in the information society. Some monopoly telecom companies prevents competitors from speeding up service delivery. Many of developing countries do not have static national strategy which provokes a proliferation of uncoordinated projects. Illiteracy in these countries as well and educational base is a major fact and this has a direct effect in the production of scientists, engineers and ICT workers. The result is an extreme skills shortage in ICT sector, followed by the brain drain to foreign countries.

Governments suffer from many problems which manifest themselves into poor service delivery and this also extends to public service ICT roll-out. Historical baggage in many forms (management, bureaucracy,

policy) hampers the rapid establishment of information-based businesses. The local ICT market is small and has to operate without economies of scale. Inadequate incentives for international investors, lack of local skills and crime limit the finances available for ICT ventures which results in less local development and poorer local economies of scale.

Opportunities: Despite some weaknesses discussed above, there are also correspondent opportunities on another hand in the developing economies. Basically, the market is still young and you can almost start anything without big competitors. According to the African Bank Report, there are numerous opportunities for entrepreneurs and investors to launch their business in. Africa has experienced rapid growth in the ICT sector and with over half a billion mobile subscribers, the continent is set to become a choice destination for telecom investors (NEPAD., 2010). The following section highlights the main ones:

- Infrastructure (communication networks)
- mobile operators mobile transactions in banking sector
- Mobile internet
- e-Government
- Broadband
- e-Agriculture
- e-Healthcare

Threats: To broaden this study, investors must as well know what is waiting for them so, that they can plan their activities according to major issues that they might encounter.

The use of computers, access to internet and other tools of ICT are limited greatly to the urban areas and the challenges faced by the ICT sector in the country include particularly the fact that the people in the rural areas are yet, to know how to use computers, noting that the people in rural areas are keyboard-shy (ITU., 2013, 2014).

According to the ITU's Report "2013 African ICT week", other challenges that developing countries face, are that the cost of broadband prices are still high compared to the general income of citizens. The aim is to reduce its cost gradually and put broadband ICT means and services within every citizen's reach and this will transform the economic situation in the long run.

There are almost no African ICT statistics centers in Africa, thus, the reliability of numbers is not high because it takes a lot of effort to collect data from Africa and analyze it in remote locations. Lastly, illiteracy is as well a

major concern that developing communities face, most people simply are not able to use electronic devices since they cannot read neither write.

CONCLUSION

After a deep study of the research question of this work, it was demonstrated that ICT is at the basis of development in all countries despite their status of being developed or not. Moreover, the study focused a lot on developing countries and how they adopted ICTs to move faster. In fact, some key principles should be highlighted than others to make sure that there is a smooth progress in the matter of implementing all policies. Not only that, governments should enhance collaboration with the private sector as a way to attract investors in the field of ICT since they need basically some pre-designed infrastructures and design according to the vision of each individual country. Moreover, the following should as well be considered:

- Development of network infrastructure technologies especially in rural areas
- Basic infrastructure needs a rapid improvement as a prerequisite to ICT development,
- Capacity building and training: ICT skills, training and awareness,
- Retention policy for trained staff with high skills in ICT
- Investment in terms of software production and their commercialization
- Dissemination of information and research related to ICT in order to share experiences and to avoid duplication and waste of time

In fact, ICTs profitability do not depend only on available software but also on the capacities of interacting them, how to design them so to meet on-site problems. There have been a lot of mismanagement in a number of organizations and organs of the government of Rwanda, not because they lack the systems but because they lack trained users, thus, leading in losses of big amounts of money to pay expats who can interact with the, so, sophisticated systems.

ACKNOWLEDGEMENTS

This study is published thanks to the support of the internal projects of University of Hradec Kralove: Economic and Managerial Aspects of Processes in Biomedicine.

REFERENCES

- ITU., 2002. The ICT development index. International Telecommunication Union, Geneva, Switzerland. https://www.itu.int/ITU-D/ict/publications/idi/material/2009/MIS2009_w5.pdf.
- ITU., 2013. Measuring information society. Information Technology University, Lahore, Pakistan. https://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf.
- ITU., 2014. Cloud computing in Africa, situation and perspectives. Information Technology University, Lahore, Pakistan. http://www.itu.int/ITU-D/treg/publications/Cloud_Computing_Afrique-e.pdf.
- MINECOFIN., 2014. Ministry of finance and economic planning. Ministry of Finance and Economic Planning, Kigali, Rwanda. <http://www.minecofin.gov.rw/index.php?id=2>.
- NEPAD., 2010. New partnership for Africa's development. NEPAD Transforming Africa, African. http://www.nepad.org/system/files/June2011_NEPAD_AIO_2010_English.pdf.
- NICI., 2014. Smart Rwanda master plan. NICI AG Company, Altenkunstadt, Germany. http://www.myict.gov.rw/fileadmin/Documents/Strategy/SMART_Rwanda_Master_Plan_v2.5.pdf.
- NISR., 2014. Thematic report characteristics, households and housing. National Institute of Statistics Rwanda, Rwanda. <http://statistics.gov.rw/publications/rphc4-thematic-report-characteristics-households-and-housing>.
- OECD., 2002. OECD information technology outlook. Organisation for Economic Co-operation and Development, France. <http://www.oecd.org/internet/ieconomy/1933354.pdf>.
- OECD., 2011. OECD library. Organisation for Economic Co-operation and Development, France. <http://www.oecd-ilibrary.org/>.
- TWB., 2015. World economic indicators. World Bank, Washington, D.C., USA. <http://data.worldbank.org/data-catalog/world-development-indicators>.
- UNNGLS., 2009. UN-DESA: World economic situation and prospects 2009: Update as of mid-2009. United Nations Non-Governmental Liaison Service, New York, USA. http://www.un-ngls.org/index.php/un-ngls_news_archives/2009/2414-un-desa-world-economic-situation-and-prospects-2009-update-as-of-mid-2009.