

Strategic Policy Note

# ‘Digital for Development’ (D4D) for the Belgian development cooperation



**THE BELGIAN  
DEVELOPMENT COOPERATION**





## Strategic Policy Note

### **‘Digital for Development’ (D4D) for the Belgian development cooperation’**

Drafted by the DGD

Approved by the Minister Mr. Alexander De Croo

In

Brussels, September 2016.

# Table of contents

Table of contents	3
Foreword	6
Summary	8
Acronyms	12
Introduction	14
I. Context and challenges	15
II. Vision	16
III. Strategic priorities	17
III.1. Better use of (big) data	18
Big data	19
Open data	21
III.2. Digital for inclusive societies	21
Democratic inclusion	23
Financial and economic inclusion	24
Equal access to quality basic services	26
III.3. Digital for inclusive and sustainable economic growth	28
IV. Principles	30
V. Operational aspects	32
V.1. Building blocks	32
V.2. Sustainability	37
V.3. Risks	39
Feasibility risks	39
Unintended consequences: the risk of doing harm	41
V.4. Partnerships	43
The European development cooperation	44

Multilateral partner organizations	44
Humanitarian organizations	45
Private sector companies	46
The Belgian D4D ecosystem	49
V.5. Strategic management	50
Funding	50
Implementation	50
Monitoring	53
Review	54
References	56



# Foreword

More than ever, our future is digital. The world around us is changing at an unprecedented pace. Not only here in Belgium or in the West, but everywhere in the world. The 'International Telecoms Union' (ITU) calculated that 95% of the worlds' population lives in an area covered by a mobile cellular network.

The potential of going digital is massive. This year, the World Bank's World Development Report 2016 focuses entirely on digital dividends, the benefits generated by digitalization. To be able to fully reap these digital dividends, we need a strong and bold Digital for Development strategy.

At the European level, Belgium is a frontrunner when it comes to Digital for Development. Belgium was behind the initiative to bring together 17 European Member States to put Digital for Development on the European Agenda. In a common letter, we invited High Representative Mogherini and Commissioner Mimica to embrace the opportunities the digital revolution offers for development. The goal is to come to a Concept Note which would anchor this topic at the European level.

This strategic note has to be read within the frame of the 17 Sustainable Development Goals. By 2030 the SDGs are set to end poverty, protect the planet and ensure welfare for all. To realize the 2030 Agenda for Sustainable Development we have to mobilize new energy and tap into new technological possibilities. Digitalization will play an important role in reaching the SDGs.

Yet, you will not find 'digitalization' among the SDGs as a goal in its own right. This is because digitalization is not a goal in itself. It is a tool that we can use to effectively reach the 17 SDGs. Just some examples that demonstrate the power of digital:

- In Tanzania it recently became possible to register the birth of children by SMS. Parents no longer have to undertake a two-day walk to the nearest village to do so.
- In Guinea 'Big Data' analyses of mobile phone records were used in the fight against ebola. Based on the analyses of these records they were able to determine the moving patterns of the people and thus predict where the disease would spread to next.

- Farmers in Uganda receive personalized commercial or technical advice on their smartphone in function of the crop on their field. This leads to a higher productivity of the farmers and allows them to get a fair price for their crop.

Every development project has to take the local context into account as much as possible. That is why this strategic note starts with the 'building blocks' and the technology that is currently at hand in a country. This approach allows us to keep a broad scope in this strategic note. In every sector – agriculture, education and healthcare – D4D can be of added value.

This strategic note is the result of multiple consultation workshops where all actors of the Belgian Development Cooperation, NGO's and private companies came together to share and argument their vision on D4D. I wish to thank everyone who actively and constructively participated at these workshops for the inspiring exchange of visions and ideas.

It is my explicit wish to offer Belgian actors a better insight and understanding of all the things that can be accomplished by Digital for Development. The potential of digital is huge. Let us unleash the full potential and put digitalization at work for realizing the SDGs.

**Alexander DE CROO**  
**Deputy Prime Minister and Minister of Development Cooperation,**  
**Digital Agenda, Telecom and Postal Services**

# Summary

This document lays out the strategic policy on 'Digital for Development' (D4D) for the Belgian development cooperation. It describes the vision and the strategic priorities of the policy, how they can be implemented, which partnerships should be established or strengthened, and how the policy will be strategically managed. It is embedded in the comprehensive approach of the Belgian development policy and should be realized through collaboration between the different local, Belgian and international development actors.

The data revolution and digital transformation which is moving forward at a fast pace in all world regions has provided numerous, but thus far unequally distributed benefits for development. The Belgian D4D policy therefore does not consider digitalization as a goal in itself, but as a crosscutting enabler to achieve better results for more people who are in need. Digitalization will transform the Belgian development and humanitarian assistance to increase our impact on the Sustainable Development Goals (SDGs). Our main role will be to connect the different actors on the ground to promote the exchange of knowledge and to foster innovative partnerships. Our approach will be guided by the two overarching principles of 'Putting people first' and 'Do no harm'.

The strategic priorities of the policy are threefold:

- **Better use of (big) data**, drawn from traditional and innovative sources: data are indispensable for setting up and monitoring any development intervention, as well as for measuring the realization of the SDGs and increasing public authorities' accountability. The Belgian development cooperation will invest in the tools and policies needed to use real-time (big) data to produce actionable insights for development actors, and thus to increase their impact. Equal attention will be given to 'open data', freely accessible to the public, to promote good governance and facilitate humanitarian relief and development, natural resource management and disaster risk reduction.
- **Digital for inclusive societies**: the Belgian development cooperation will use the potential of digitalization to both maximize the number of beneficiaries of an intervention and to lower the threshold for vulnerable groups to enjoy democratic rights, to have equal access to basic services, to participate in public life, and to be financially and economically included in society.

- **Digital for inclusive and sustainable economic growth:** in line with its policy priority to promote sustainable inclusive economic growth, the Belgian development cooperation will deliberately support interventions that turn digitalization into a positive force to create (self-)employment and to promote socially responsible entrepreneurship.

This strategy adheres to the nine principles for digital development ([digitalprinciples.org](https://digitalprinciples.org))<sup>1</sup>, while at the same time stressing the need for a cost-benefit analysis as well as the importance of complementing D4D with existing and still needed offline strategies.

The available options for the implementation of the strategic policy vary greatly according to the local context. Basic foundations that need to support an effective D4D-approach include the availability of ICT infrastructure and electricity, the presence of human skills to use and manage the technology, sound leadership and a favorable regulatory framework. Where absent, the Belgian development cooperation will provide due attention to these basic foundations. The tools that can be utilized are manifold and include electronic identification systems, mobile money, social media, SMS platforms, geographic information systems, among others. They need to be chosen in function of the local context.

Central to the sustainability of digitalization strategies are measures to ensure local ownership (including the involvement of the local authorities) and knowledge transfer, to strengthen local D4D ecosystems that are well-integrated in regional and international networks, and to respect the environmental sustainability (managing e-waste and adopting climate-friendly practices).

D4D involves a number of specific risks. They include feasibility risks (barriers for people or administrations to use digital tools, difficulties to access data, or false assumptions) and also risks of doing harm. The latter include the potentially negative impact on rights through applications of digital technologies that affect people's privacy, security or property rights; increased vulnerability to cybercrime; distortion of traditional goods, services or labor markets; and the risk to create new or deeper inequalities as a result of the digital gap. These risks have to be taken into account and the necessary accompanying measures (e.g. regulations) need to be foreseen in order to prevent or mitigate them.

---

<sup>1</sup> For more information, see §44 (p.30).

The D4D strategy will be implemented in close collaboration with all of the actors of the Belgian development cooperation (BTC, BIO, actors of the non-governmental cooperation). International partners include the European Commission, and other EU member states, multilateral organizations, development banks, and humanitarian organizations. There is also a strong need to develop partnerships with international and local private sector companies, since they develop technology and bring innovation, expertise, investment, risk management, sustainable business models and wealth creation. The specific modalities for collaboration are listed in this strategic policy note. The Belgian development cooperation will also support the creation and operation of a Belgian D4D platform, providing networking opportunities for all public and private actors interested in D4D.

This strategic policy focuses on digitalization as an enabler and accelerator in all of the different sectors where the Belgian development cooperation is active, not as a goal in itself. For this reason, no separate fund will be created for D4D. This, however, does not exclude that specific incentives or contributions will be provided to facilitate the crosscutting integration of D4D.

This document lists the key actions to ensure the effective implementation of this policy involving all of the actors and partners of the Belgian development cooperation. The implementation of the strategy will be monitored through tagging all interventions in the Belgian ODA database according to the three strategic priorities mentioned above allowing for deeper analysis, as well as field visits and, to the extent possible, impact evaluations. A review of this strategic policy note is foreseen after two or three years.



# Acronyms

BIO	Belgian Investment Company for Developing countries
BTC	Belgian Development Agency
CMS	Citizen Monitoring System
D4D	Digital for Development
DGD	Directorate General for Development Cooperation and Humanitarian Aid
DRC	Democratic Republic of Congo
EU	European Union
FEDICT	Belgian Federal Public Service for Information and Communication Technology
ICT	Information and Communications Technology
ILO	International Labor Organization
IT	Information Techonology
ITU	International Telecommunication Union
LODA	Local Administrative Entities Development Agency
mVam	Mobile Vulnerability Analysis and Mapping
ODA	Official Development Assistance
SDG	Sustainable Development Goal
SMS	Short Message Service
ULB	Université Libre de Bruxelles (name of a university in Brussels)
UNCTAD	United Nations Conference on Trade and Development
VUB	Vrije Universiteit Brussel (name of a university in Brussels)



# Introduction

1. This document lays out the strategic policy on 'Digital for Development' (D4D) for the Belgian development cooperation. It describes the vision behind this policy and focuses on three strategic priorities. It also provides guidance for their implementation, referring to a number of principles, basic conditions and building blocks, and risks to take into account. It explains how it is necessary to build new partnerships and to strengthen existing ones. And finally, as it aims to be a 'living' ongoing policy, mechanisms for its strategic management are also provided. Even though there may be linkages, the focus on development means that the digitalization of internal processes within the Directorate General for Development Cooperation and Humanitarian Aid (DGD) or other actors of the Belgian development cooperation is not addressed in this document.

2. The Belgian development cooperation is shaped and delivered by its different actors, whom have different governing structures, levels of autonomy and areas of specialization. This policy note has therefore been elaborated in a participatory way seeking to build on the comparative advantages of these different actors<sup>2</sup> as well as those of the private sector. This note could not have been produced without the active contribution of all. As the strength of the Belgian development cooperation lies in its ability to work coherently and effectively towards collective development goals, it is hoped that this policy note will contribute to fostering such a coherent and effective approach in the area of D4D.

3. This document should not be considered as a stand-alone policy, but should be read in combination with the legal framework and the other strategic policy notes for the Belgian development cooperation on topics such as health, education, gender, environment, etc.<sup>3</sup> These notes are complementary to one another and should all be considered to be part of a comprehensive approach.

---

<sup>2</sup> As part of this process, a mapping exercise of ongoing interventions that already include a digital component has been conducted in January 2016.

<sup>3</sup> The strategic policy notes are available at: [http://diplomatie.belgium.be/en/policy/development\\_cooperation/multimedia\\_library/strategic\\_notes](http://diplomatie.belgium.be/en/policy/development_cooperation/multimedia_library/strategic_notes)

4. Development does not happen in an isolated environment. This document sets out how D4D is approached from a Belgian perspective, but its implementation will be the result of interaction with all of the local development actors in the partner countries – from a human rights perspective this includes first of all the rights holders and duty bearers themselves - who collectively have to own the development process, and with all of the other external development partners that are contributing in this area.

## **I. Context and challenges**

5. Anno 2016 no one can ignore the data revolution and digital transformation and their potential to change the world. This change is happening at different places and at different rates, but these processes increasingly have an impact on one another as the world is more and more interconnected. Internet penetration in Africa, for example, is 16% today and expected to be around 50% in 2025 (McKinsey & Company, 2014). Faster even, on average 8/10 individuals in the developing world already own a mobile phone (World Bank Group, 2016).

6. These new technologies bring a variety of benefits for development. The World Development Report 2016, however found that these "digital dividends" are not automatic and that not everyone benefits equally. This is because the "analogue complements" which are needed to enable these benefits - adequate policies and regulations, newly required skills and accountable institutions - are not equally present everywhere. On top of that, a lack of (access to) infrastructure (electricity, fiber connectivity) still prevents a large number of people of being digitally connected to the rest of the world. 0.5 billion people live in an area with no mobile signal. (World Bank Group, 2016) The offline population is disproportionately rural, poor, illiterate, elderly, and female (McKinsey & Company, 2014).

7. Yet, the fact that more households in developing countries own a mobile phone than they have access to electricity or clean water (Mishra, 2015) presents an unprecedented opportunity to use digitalization to promote development. Prof. Jeffrey D. Sachs, Director of the Earth Institute and Special Advisor to United Nations Secretary-General Ban Ki-moon on the Sustainable Development Goals, wrote: "ICT is the most powerful new tool we have for solving the world's major challenges—ending poverty and hunger, ensuring universal access to basic services, and making the transition to a low-carbon economy", introducing a report that goes on to explain in detail how information and communications technology (ICT) can accelerate action on the Sustainable Development Goals. (The Earth Institute

Columbia University & Ericsson, 2016) Indeed, one can already observe that ICTs are active in almost all development issues and sectors while ICTs are also increasingly part of all aspects of development processes. (UNCTAD, 2014)

8. We are therefore undoubtedly facing a new development context, with both new challenges and new opportunities. Rather than passively undergoing these changes, the Belgian development cooperation has decided to proactively grasp the opportunities and find the best way to deal with the challenges involved.

## **II. Vision**

9. Whereas digitalization is not a panacea, it provides us with a promising opportunity to innovate and work differently. Our vision is therefore to widely use digitalization to contribute to transforming the Belgian development cooperation. This transformation is about new and better ways to go about international development in order to enhance its impact. This means achieving better results and reaching out to larger numbers of beneficiaries and to those most in need. It also means focusing limited development resources where they are most needed and can help mobilize additional and more sustainable resources, e.g. through mechanisms for domestic resource mobilization or private sector engagement.

10. The intended impact is framed by the Sustainable Development Goals (SDGs) of Agenda 2030, as adopted by the United Nations in September 2015. Digitalization is therefore no goal in itself, but a strong enabler and accelerator that can help achieve the SDGs. One of the sub-targets of SDG 5, for example, also refers directly to this: “Enhance the use of enabling technology, in particular ICT, to promote the empowerment of women”. Digitalization can also help improve the delivery of humanitarian relief, disaster risk prevention and transitional support<sup>4</sup> bridging humanitarian with development assistance in fragile, disaster prone and conflict affected contexts. It is not a matter of choosing between digitalization or fulfilling basic needs/rights, but rather using the potential of digitalization in order to better fulfill these basic needs/rights.

---

<sup>4</sup> E.g. first steps towards building social safety net systems.

11. Through this transformation, the Belgian development cooperation will position itself as a strong champion of the promotion of D4D in a number of well-defined areas.<sup>5</sup> Our main role will be to connect the different actors on the ground to promote the exchange of knowledge and to foster innovative partnerships. Our approach will be guided by the two overarching principles of 'Putting people first' and 'Do no harm'.

### **III. Strategic priorities**

12. Digitalization can play an important role in all of the sectors where the Belgian development cooperation is active. This includes health, education, agriculture and food security, basic infrastructure, water and sanitation, governance, social protection, financial services and others. It can equally contribute to the crosscutting goals in terms of gender and the environment. It is also a strong enabler to achieve the overarching priorities of the Belgian development cooperation, which are inclusive economic growth and human rights.<sup>6</sup>

13. This strategic policy note therefore sets out to integrate digitalization in everything we do when it can contribute to the above-described vision<sup>7</sup>. It is everyone's business and all of the actors of the Belgian development cooperation are expected to engage in this area based on their own distinct comparative advantage.

14. The crosscutting nature of digitalization does not prevent us from adopting a clear focus. Three priorities are set out where the Belgian development cooperation will add value and build a strong visible presence. They are 'better use of (big) data', 'digital for inclusive societies' and 'digital for inclusive and sustainable economic growth'.

---

<sup>5</sup> See 'Strategic priorities' below.

<sup>6</sup> Please consult the Law on the Belgian Development Cooperation for more information.

<sup>7</sup> This provides implementing partners with the possibility to 'opt out' when their detailed and documented analysis of the specific local context shows that digitalization does not help enhance the development impact.

### III.1. Better use of (big) data

15. Data provide the basis for almost any development and humanitarian intervention. They allow for objectively describing the situation or the problem that one will address, whether this is poverty, environmental degradation, a health concern or the weak position of women in society. They can also allow for describing macroeconomic dynamics and producing aggregate market information that help inform opportunities for economic development. Insights derived from data can move decision makers and people into action. Moreover, data, if turned into timely, accurate and useful information, are crucial to provide a development policy or intervention with a relevant and targeted strategic focus. They allow for proper monitoring during implementation, adjusting policies and interventions when needed, and for evaluating their results and impact upon completion. Data provided by the users themselves also allow for increased beneficiary participation in all of these processes. Data is also needed to keep track of a country's progress towards the SDGs. In addition, transparent data can enhance the accountability of public institutions helping to prevent corruption and mismanagement.

16. Yet, all of the partner countries of the Belgian development cooperation face severe data gaps and quality issues with the available data. As a result, development and humanitarian actors, whether they are government agencies, civil society organizations, donor agencies or others, base their actions on old, approximate and incomplete data, simple assumptions or highly expensive one-off data-collections. This severely limits their possibilities to adopt an evidence-based approach and leads to inefficient use of scarce resources. These constraints also limit public transparency and community participation in development interventions.

17. The digital revolution provides us at the same time with unprecedented opportunities to source, collect, analyze, and utilize data and communicate resulting actionable insights. These opportunities allow "willing governments to extend services into communities which until now have been blank spaces in planning processes, and to implement policies more efficiently, meaning that a data revolution could, in the medium term, pay for itself" (Stuart et al. 2015). Taking advantage of these new opportunities for development and humanitarian purposes is therefore both highly innovative and strategic.

18. It is therefore a priority to invest in and utilize data tools to enhance the impact of our development and humanitarian efforts. Hereafter two aspects of data that the Belgian development cooperation will focus on are explained in more detail. There can be an overlap between these two aspects, but they are highlighted separately because of their distinct potential to enhance impact.

## **Big data**

19. The world's technological capacity to compute and store information has grown at an exponential rate (Mishra, 2015). Big data refer to large volumes of information which can come from different sources such as telecom records, social media, sensors, point-of-sale terminals, GPS devices, and so forth. Using innovative tools, these large volumes of granular data can be analyzed to produce meaningful information, including better predictions<sup>8</sup> and risk maps, on issues such as poverty, population movements, literacy, food insecurity, etc. This can continuously provide information in real time and at a lower cost. There are examples of how big data analysis has helped in the Ebola-crisis in West-Africa (see box below) - analyzing people's mobility - and in the delivery of humanitarian assistance - analyzing food prices and nutrient content of purchases made by beneficiaries. The Institute of Development Studies (2015) found that sectors such as health, nutrition, and education can gain high benefits from big data. The United Nations (UNDP et al. 2016) find that it is a great opportunity to ensure gender-disaggregated data at all levels.

In response to the Ebola virus disease epidemic, UNICEF worked in partnership with the Government of Sierra Leone and mobile network operators to use call data records (CDRs) to map people's mobility. It became clear that CDRs were a powerful proxy to: (a) identify risks (e.g., are people from hotspots moving to low-infection locations?); (b) design information campaigns (e.g., where can communication resources best be deployed to maximize coverage of information campaigns?); and (c) show the impact of actions (e.g., are curfews/blockades really working to keep people from moving after dark or across blockade lines?). (UNDP et al. 2016)

---

<sup>8</sup> Big data sources such as mobile phone call records and satellite imagery have been shown to accurately predict the multidimensional poverty index with a correlation of 0.88 in the case of geographical sectors in Rwanda. (Njuguna & McSharry, 2016)

20. Use of larger sets of data can potentially increase reliability but can also lead to more biases (due to existing disparities in access to digital technology and respondents are not necessarily coming from spread socio-economic or racial groups) (Institute of Development Studies, 2015). In addition, big data analysis tends to use proxy indicators, such as making poverty statements based on satellite images of roof tops, which can raise questions of validity. With big data, it is therefore equally important as with traditional data to pay due attention to the validity and reliability of the information one wishes to use. New methods will therefore also need to be scientifically proven. This also explains why there is a need for development investment in this area and for collaboration with academic institutions.

21. When big data are in private hands, there is a need for collaboration with the private sector (Mishra, 2015). Such collaboration can take different forms and can be classified into four types: the in-house production of statistics by the data provider, the transfer of private data sets to the end user, the transfer of private data sets to a trusted third party for processing and/or analysis, and the outsourcing of national statistical office functions (Robin et al. 2015). It is also possible to develop encrypted information which can be used by external partners, whilst ensuring data privacy and protection. The most suitable collaboration model should be defined and based on a thorough capacity analysis of the local partner. Where new dependencies are created it is important to pay due attention to sustainability<sup>9</sup>. Also note that certain market actors have a vested interest in controlling data, so that efforts to make data more democratic need to take this into account.

22. For its interventions, the Belgian development cooperation will determine what data are needed in function of the development challenges to be tackled, what rules are required to protect private data without impeding access, and what systems and infrastructure are required to ensure data quality. Quality data will be driven by common standards, efficient collection tools, robust communications networks, and mechanisms to share and assess data. This can, for example, result in support to national statistical offices in partnership with private sector companies, whereby existing traditional data are better exploited using digital tools and new digital data sources are added to provide better information.

---

<sup>9</sup> For more information, see also §76 (p. 42).

## **Open data**

23. Open data is about making data freely accessible to the public. Data can be more or less 'open' depending on the nature of the data (primary instead of aggregated data; complete; timely), the format in which they are made available (unstructured versus using open standards which allow for others to easily reuse the data; language used) and their accessibility (costs and procedures involved to access the data; permissions granted to use the data). Presenting open data from different sources via Internet based or mobile applications to users can have an important impact on humanitarian relief and development. Local communities can act both as providers and users of information. Users can also help validate and improve the quality of data.

24. Promoting open data on weather, climate and trans-boundary water flows is, for example, of critical importance to tackle climate change, improve natural resource management, and support agriculture (World Bank Group, 2016). Open data can also be instrumental for disaster risk reduction, good governance (e.g. financial transparency, accountability, parliamentary openness), and increasing economic productivity, among others (Third international Open Data conference, 2015).

25. The Belgian development cooperation will invest in making those data that are important for development more 'open' and accessible to the national and local actors and stakeholders (or, referring to the human rights based approach: duty bearers and rights holders) in the partner countries. This involves brokering partnerships to access data sources, promoting the development of systems and applications that bring those data to the users, building skills and capacities to manage open data as well as assisting governments to define policies for open data. Open data can also be an enabler for academic collaboration and joint research with local universities from the partner countries.

## **III.2. Digital for inclusive societies**

26. The "World Development Report 2016: Digital Dividends" finds that the benefits of digital are neither equally spread nor automatic. The digital revolution is therefore often leading to even higher inequalities and exclusion in the partner countries of the Belgian development cooperation. At the same time, however, digital technologies can be instrumental for humanitarian and development actors to bridge gaps and foster a more inclusive and a more cohesive society.

27. The Belgian development cooperation will therefore focus on using digital technologies for greater inclusion. This is strongly in line with the principle of 'leaving no one behind' from Agenda 2030. It refers to the inclusion and empowerment of disadvantaged groups such as women, unemployed youth, ethnic minorities, remote populations, the elderly, the poor, the illiterate and others depending on the specific local context. It is also in line with the human rights based approach to development. The aim is to promote inclusive societies where everyone can benefit from basic services and participate actively in the political, economic and cultural life. This will enhance social cohesion and resilience and thus reduce fragility<sup>10</sup>, which characterizes the situation in many of our partner countries.

28. Digital technologies can make it possible to promote inclusion in two different ways:

- Multiplier: use tools which allow for maximizing access and thus maximize the number of beneficiaries of the intervention.
- Threshold: use tools in such a way as to lower the threshold for access to vulnerable groups that otherwise face certain barriers.

To be able to multiply access or to lower the threshold for access, it is necessary to adapt the digital tools to the particular local context. For example, in a number of developing countries 3G or 4G connectivity is more important than fiber networks which demand important investments and are not available to lower middle class and certainly not to the majority of the population. It is also necessary to make digital content and use understandable and relevant for the less literate users (Ranger et al. 2015) in order to avoid new factors of exclusion.

29. The specific types of inclusion that the Belgian development cooperation will foster through the use of digital technology are described hereafter. They are mutually reinforcing and contribute to more inclusive societies as a whole.

---

<sup>10</sup> See also the Strategic policy note on fragile situations.

## **Democratic inclusion**

30. A human rights based approach to development and humanitarian assistance places people at the center of our attention. Accurate information on citizens is therefore a basic necessity. When the existence of citizens is not known and not documented, it is impossible to guarantee their rights. The World Development Report 2016 indicates that digital technologies can help establish population registers (e.g. birth registration via SMS) and provide people with digital identification documents. "Lack of identity is an impediment for poor people to exercise their basic democratic and human rights." (World Bank Group, 2016, p.17)

31. Digital technologies can also help increase electoral accountability, as they enable citizens to monitor voting processes and report violence and voter intimidation. This in turn improves electoral participation. (World Bank Group, 2016) Digital technologies can equally enhance accountability in other areas of public governance, as they provide citizens with tools to monitor the decisions taken by the government. They also provide governments with tools to allow citizens to become part of the decision making process. (UNCTAD, 2014) This potential, however, is not automatic and digital strategies need to be combined with a real commitment to enhance citizens' participation and to provide an enabling environment for civil society organizations.

Satellite Agency SES aided in the **2015 Burkina Faso elections** by installing 368 VSATs (Very Small Aperture Terminals) all over the country. This allowed the elections to be electronic, transparent and live broadcasted on television.

32. Digital accelerates the growth of social and political movements, as seen in the Arab spring in 2011. Time and distance are no longer a problem in a world of real-time information. Social and political movements can reach more people in a short time. (Ross, 2015) Digitalization is therefore a democratizing force and can give citizens new tools to express their voice (e.g. through e-petitions, feed-back/complaint mechanisms for greater accountability) and to be better informed. Young people especially tend to be less involved in traditional political and civil society structures, as they start to communicate through digital networks. This leads to new movements for change and institutions have to be receptive to this.

33. In order to contribute to more democratic inclusion, the Belgian development cooperation will therefore draw on the potential of digital and the available Belgian expertise in this area (e.g. at FEDICT<sup>11</sup>) when providing support to national registration and identification processes. The use of digital will be promoted when enhancing public accountability and citizens' participation in support to eGovernment strategies.

## **Financial and economic inclusion**

34. Digitalizing payments (mobile money, e-vouchers, etc.) brings a number of distinct benefits to developing countries. Digital payments can be more rapid, efficient and generate fewer costs. Lower transaction costs open the market for the poorest and expand the remittances market<sup>12</sup>. Digital payments enhance transparency and security, as they are easier to follow and keep track of. This helps reduce the risk of corruption and cash payment related crimes (theft, bribery, ..). (Faye & Niehaus, 2015; Better Than Cash Alliance, 2015) Financial inclusion also helps facilitate domestic resource mobilization.

35. Digital financial services also increase social protection (rapid money transfer, savings, insurance, credit services) and promote inclusive growth, reducing income inequality, when accessible to all. In most developing countries, the majority of the population is unbanked. People use more informal services than formal ones and those who have an account use it only to receive their wage. It gets worse in rural areas because of the cost of formal services and the distance from urban centers. As a result, most smallholders lack sufficient financial services to invest in their farms or business, improve productivity, manage risks/ respond to shocks (e.g. unexpected medical expenses) and to get connected to markets. Women are more subject to this financial exclusion than men and are therefore quicker to use mobile services. (Martin et al. 2016) Indeed, one should not just consider women to be a vulnerable group. They are savvy and capable consumers, who have the potential to drive market innovations. Women often use informal products or are limited by the open and public nature of traditional, cash based services. Digital products provide women with more discreet, convenient, and often more functional services that can catalyze market development for digital services. Digital financial services, for example, can give women access to a better control of household finances as well as to more economic opportunities. (Better Than Cash Alliance, 2015)

---

<sup>11</sup> Belgian Federal Public Service for Information and Communication Technology.

<sup>12</sup> In Kenya, the cost of sending remittances dropped by up to 90 percent after the introduction of M-Pesa, a digital payment system that now provides additional income for more than 80,000 agents. (World Bank Group, 2016)

**Syngenta Kilimo Salame (Safe Farming) project** in Kenya and Rwanda monitors agricultural events and data on weather patterns and facilitates linkages with insurance to provide a safety net for farmers while promoting agricultural investment and improved livelihoods. M-Pesa keeps index insurance premiums more affordable to make smallholder farmers more commercially viable (ITU & Cisco, 2016). This is interesting, because it helps automate claims process, cultivating a financially enabling environment for small businesses.

36. Digital technologies such as SMS and mobile phone apps provide new tools to circulate economic information and empower poor and isolated people in a more inclusive economic development process. Several examples exist in the agricultural sector, as highlighted in the box below. Through improved mapping it is also possible to deliver accurate land and property registration services to the poor, helping them secure an important asset which they can use productively as collateral in financial transactions to obtain access to credit and thus create new businesses and jobs.

**iCow** in Kenya is an application created by Su Kahumbu, a farmer and engineer who created this app in order to simplify the farmers' life and to enhance their economic gains. iCow functions on mobile phones via texting: it allows the farmers to introduce data about their cows, to find a nearby vet or to know the value of cows or milk on the local market. The farmers don't need to go for a half day walk to find a good buyer. See also [icow.co.ke](http://icow.co.ke) (Ross, 2015)

37. The automation of processes and technology's fast evolution also mean that some people are not able to follow and lose their jobs. (Wladawsky-Berger, 2015) Technology, however, also allows for the creation of new jobs and can be powerful to facilitate new opportunities for entrepreneurship. This underscores the importance of setting economic inclusion as a goal and providing beneficiaries with the necessary support (e.g. skills development, incubators and other support to start ups, job fairs, etc.) throughout the disruptive transformation of their economy<sup>13</sup>.

---

<sup>13</sup> See also §77 (p. 42).

## **Equal access to quality basic services**

38. Digital technologies can enable low-income communities and communities 'on the move' (e.g. refugees) to get access to quality basic necessities and services such as food, health, education, water, electricity, social protection, humanitarian relief and other private or government services. On the supply side, these tools are powerful enablers to enhance quality through for example digital management systems, including more transparent resource mobilization, financial and asset management, remote access to high level expertise and resources (such as medical expert diagnosis and high quality education content and pedagogical tools). Improved mapping of the demand for and effective use of services, through for example geographic information systems, helps to better target investments in the provision of basic necessities and services. In addition, feedback systems allow users to rate the quality of the services. This information can be used as part of a result based financing system and eventually lead to increased user satisfaction and protection.

The **Citizen Monitoring System (CMS)** is a tool introduced by BTC through the Rwanda Decentralization Support Program to manage complaints by citizens regarding infrastructure and social protection. Citizens can report issues telephonically or by email and all complaints are captured in a centralized system managed by the Local Administrative Entities Development Agency (LODA) and the Districts. Each District is responsible to address the issues within their territory. LODA is only supervising and ensuring that Districts are actually addressing the issues and not lagging behind.

The use of CMS will enhance participation from citizens and management of infrastructure by the government as issues with infrastructure are more easily known (e.g. if there is a large pothole in a road, citizens have the responsibility to report it, and government to repair the road).

39. Empowering users of social services with digital tools can also lead to increased citizens engagement and forms of e-collaboration where citizens co-produce government goods and services via the use of technology (e.g. interactive community mapping) (UNCTAD, 2014). 'Human sensors' and 'collective intelligence' are other examples of how networks of people, both locally and remotely based, can be connected through digital communication tools and help identify innovative and sustainable solutions to specific problems in basic

service provision. These new networks enhance accountability and transparency and allow for real time monitoring of program implementation. Important characteristics of these networks are that they are open to everyone and that participants contribute on a self-selected basis. (Edgeryders<sup>14</sup>) Digitalization also allows existing social organizations, trade unions and movements to more effectively communicate with their members.

40. With use of sensors, digital technologies also provide new opportunities to remotely manage basic service provision such as water and electricity, as a cost effective solution to reach people in isolated areas. It can also allow users to pay for these utilities according to a pay-as-you-go system (e.g. through automated prepaid water dispensers). This helps to make the services more accessible in poor communities.

The **Renewable Energy for Rural Development** program implemented by BTC in Mozambique installed hundreds of off-grid solar systems on social infrastructure like health centers, schools and administrative buildings. In close collaboration with Belgium Campus in South-Africa, they developed a low-cost generic monitoring system, sending the vital system parameters over a mobile phone network to a central maintenance unit, from where teams on the field can be dispatched cost-effectively. Remote assistance to users is also possible and can solve many problems at virtually no cost. The research project is still ongoing. It will be scaled up in a next phase and extended to other uses, such as water systems.

41. E-government and m-government applications contribute to making public services quicker and cheaper to access, improve consistency and citizen satisfaction, and significantly reduce corrupt payments. (UNCTAD, 2014) In urban contexts, as many partner countries are characterized by rapid urbanization, digitalization also allows to establish building blocks towards – in the longer run – the concept of ‘smart cities’. In ‘smart cities’, digitalization enhances quality, performance and interactivity of urban services, to reduce costs and resource consumption and to improve contact between citizens and government. It is a key priority in the response to climate change.

---

14 Based on exchange with their Founding Director and CEO, Ms. Nadia EL-Imam. See also <https://edgeryders.eu/>

**eGhana** is the title given to the “digital reincarnation” of Ghana’s government. The project, aims to improve the efficiency and coverage of government service delivery through the use of modern technologies, particularly improving on two online portals recently launched by the Ghanaian government: Government of Ghana On-line Services Portal and the Ghana e-Payment Platform (**GEPP**).

The online platforms are expected to significantly reduce paper-based application forms and shorten congested queues at the Ministries, Departments and Agencies by providing services, such as paying taxes or applying for a passport, via the Internet.

Further benefits include: improving revenue mobilization, enhancing the economy by direct transfer of funds and reducing the administrative costs of the institutions<sup>15</sup>.

### **III.3. Digital for inclusive and sustainable economic growth**

42. Digitalization is recognized as a major force for jobs, growth and prosperity, also in developing countries (World Bank, 2016). In line with its policy priority to promote sustainable and inclusive economic growth, the Belgian development cooperation will deliberately support interventions that turn digitalization into a positive force to create (self-)employment and to promote socially responsible entrepreneurship. Local digital ecosystems need to be strengthened through skills training, technology hubs or incubators and seed capital.

---

<sup>15</sup> Source: <https://blogs.worldbank.org/governance/expect-no-lines-front-digital-counters>

A new model of intensive technology trainings emerged: **coding bootcamps**. Bootcamps are effective skills accelerators that teach specific technical skills (from coding to digital marketing) through intense fast-track courses with a strong career focus. The bootcamps approach, which lies at the core of rapid technology skills training programs, covers all three facets of the skills gap problem. Firstly, it focuses on rapid training - 9-12 weeks, after which graduates are prepared to undertake the job in the industry. Secondly, it focuses on applied skills - from digital marketing to programming. Thirdly, it places a strong emphasis on career readiness, as bootcamps typically emerge in response to job market needs. Some of them also provide guidance on soft-skills, such as preparing participants for job interviews through career coaching and by helping them build their professional portfolios. (Paradi-Guilford and Khomyn, 2016)

43. This includes building solid bridges between the world of work and education/training providers, so that skills can be matched to market needs, and using digitalization to widen up the employment market for job seekers (e.g. tools to match job seekers with the most suitable opportunities; better data on labor markets). It also includes support to local private sector development when digitalization leads to the creation of more and better jobs, in line with the existing Belgian policy to promote decent work.

For the past decade, BTC and other Belgian public and private development actors have implemented the VUB-driven OpenClinic GA hospital information management system in more than 60 sub-Saharan hospitals. In each of these health facilities at least 1 local IT-professional has been trained by the Belgian implementation partners to maintain the system and to provide first level user assistance. Many of these IT-professionals have used this newly acquired expertise to create their own small companies that hired and trained additional staff and today offer ongoing technical support to local health facilities. This has been the case in Mali, Republic of Congo, DRC, Rwanda, Burundi and Kenya.

## IV. Principles

44. A number of international organizations have agreed on 9 principles for digital development ([digitalprinciples.org](http://digitalprinciples.org)), which are:

1. Design with the User
2. Understand the Existing Ecosystem
3. Design for Scale
4. Build for Sustainability
5. Be Data Driven
6. Use Open Standards, Open Data, Open Source, and Open Innovation
7. Reuse and Improve
8. Address Privacy & Security<sup>16</sup>
9. Be Collaborative

45. Whilst endorsing the above principles, this strategic policy note also emphasizes the need for a thorough cost-benefit analysis. While the cost of digital often seems low (the rapid adoption of social media was driven by the ability to set up and use accounts with no costs other than time and energy), there are several hidden costs such as server costs, security measures, staff time, beneficiary privacy... Digitalization may also cannibalize existing revenue streams. For example, a museum that will put its collection online can lose a number of visitors who pay entrance. (Bernholz, 2015)

46. Another important, over-arching principle when adopting a D4D approach is that one should not ignore the necessary offline strategies. Digitalization is not a panacea that will solve all problems on its own. It is an important tool in our tool box, but it does not make some of the other tools less important. For example, one should “not underestimate offline mobilization of civic action: SMS-based feedback on rural water supply problems in Tanzania only received 53 texts in the first six months and was then abandoned. Political participation of the poor has remained rare.” (World Bank Group, 2016, p24)

---

<sup>16</sup> United Nations Global Pulse developed and implemented data privacy and protection principles and established the Data Privacy Advisory Group: [www.unglobalpulse.org/privacy](http://www.unglobalpulse.org/privacy)



## V. Operational aspects

### V.1. Building blocks

47. A number of basic conditions need to be in place to allow for the use of digital technologies. In this regard, local contexts can differ strongly from one another. It is therefore important to start the design of a development intervention from the specific local context and available capacities. Where essential capacities and connectivity are missing – which is often the case in the least developed countries - it is necessary to build coalitions with other actors who can support those (e.g. Development Finance Institutions, multilateral donors, private sector companies) or to integrate these components in the intervention. The importance of these basic conditions also means that interventions should set realistic ambitions.

### Energy

48. Digital solutions require electricity. Whereas batteries can support several devices for some time, eventually they need recharging (or replacing) and occasional access to a power source. Access to electric power is not everywhere available and needs to be taken into account when designing a development intervention. Local solutions to provide a limited amount of electric power exist and may need to be provided in order to allow for a digital intervention. As mentioned above, digital solutions may actually contribute to the provision of electricity, such as the monitoring of off-grid solar systems via SMS to bring affordable electricity to lower income families (ITU & Cisco, 2016, p.29)

A WSM (Belgian NGO Wereldsolidariteit/Solidarité Mondiale) project in collaboration with ACV (Belgian labor union) helped a **women's group in Benin install solar panels** to operate their cooling equipment for the transformation of cassava. At the same time it provided them with an opportunity to allow their members to charge their mobile phones. Mobile phone communication ensured that these women did not have to undertake long journeys to find out that there is an oversupply on the market. A simple SMS is now sufficient to find out. (11.11.11 Coalition of the Flemish North-South Movement)

## ICT infrastructure

49. Digital solutions obviously rely on the availability of some level of connectivity and basic ICT equipment. Bringing in new equipment enhances the risks involved (limited local capacity to use, maintain and renew the equipment), so it is preferable, where possible, to use available technology, especially the technology which is used by some of the most vulnerable populations. Whereas broadband Internet connectivity is not always available, mobile phone networks are much more widespread in the partner countries of the Belgian development cooperation, and still expanding. This allows for the use of SMS, mobile phone calls, or simple applications using 2 or 3G. Yet some applications will require higher bandwidth (e.g. in e-learning or telemedicine), hence the need to evaluate new ways of connecting, for example by combining existing satellite infrastructure with mobile and Wi-Fi solutions<sup>17</sup>. Connectivity does not always need to be constant and will have to be analyzed on a case-by-case basis. There are examples of users entering data on the phone, which are only sent through at a later time when they are able to connect to a network. Sometimes one can also provide simple technical solutions for connectivity such as using Whitespace (see box below).

**Using Whitespace for rural Wi-Fi:** there is unused radio spectrum due to technical requirements but also to technical changes such as digital television. This unused spectrum could be used to give access to broadband Internet in rural areas by facilitating the experimentation and adaptation of emerging technologies such as whitespace. Whitespace power stations can be charged with solar panels. (UNCTAD, 2014)

50. The World Development Report, however, does emphasize that in order to fully reap the benefits of digital technologies, the availability of broadband infrastructure for affordable and widespread access to Internet will eventually be necessary. This infrastructure includes two separate layers that need to be present: the connectivity layer (backbone networks, access networks, Internet exchange points), and the digital platforms layer (data centers and cloud systems, portals and service interoperability platforms, cybersecurity response infrastructure, etc.). (World Bank Group, 2016)

---

<sup>17</sup> An example are Hot Spots for broadband connectivity in public places in villages to give access to Internet for exchange of information on agriculture, health and education.

## Skills and expertise

51. As essential as ICT infrastructure and energy are the human skills needed to use the technology at hand. Apart from specific ICT skills, this also includes language, literacy, analytical skills, etc. When the technology is simple, it may not be too difficult to contribute to developing the necessary skills. However, when not everyone possesses these skills, one should be cautious that the use of digital does not become a new factor of exclusion. This may especially be the case for older or illiterate people who are less likely to acquire these new skills. As two thirds of illiterate people globally are women, paying specific attention to their skills development remains crucial. Another reason for this is that girls and women are still underrepresented in the STEM<sup>18</sup>-related educational programs.

52. In the case of more advanced skills, such as data science, it is an often cited problem that the people trained move on to use these valuable skills in other environments and for other employers. Such a brain drain justifies the need for ongoing capacity development and skills renewal. The rapid evolution of information technology and its applications is another reason why digital capacity building must be a continuous process. The need for long term education and training solutions in close collaboration with local education structures should therefore be taken into account in order to achieve a sustainable impact (see also below).

In Burundi, BTC implements an initiative for hosting **Certificates in Applied Health Informatics at the National Institute for Public Health**, in close collaboration with Belgian universities (VUB and ULB) and other Belgian non-academic development actors. These certificates are post-graduate specializations in e-health open to nurses, physicians, paramedical technicians and computer specialists and are considered an instrument for building broader e-health capacity within the health care community.

---

<sup>18</sup> STEM stands for Science, Technology, Engineering, and Mathematics.

53. Depending on the context, digitalization can provide new opportunities to support skills development, e.g. through e-learning and blended learning. This is already integrated in the interventions of several actors of the Belgian development cooperation who use the power of distance learning to improve vocational and technical training and lifelong learning programs and will continue to be promoted. Digitalization also allows for increased international collaboration between universities, which can help bridge the existing scientific divide.

## **Good governance and leadership**

54. Good governance is an important condition for any development intervention. Policies and regulations that prevent conflict, empower people, create a favorable business climate, promote rational use of scarce resources, protect the public interest such as a good natural environment, etc. especially have a tremendous impact on the long term benefits that a development intervention may bring and this is also true for D4D.

55. In addition, new technologies require new capacities in terms of governance. The main conclusions of the World Development Report 2016 found that sound regulations (e.g. a coherent framework to expand connectivity) and accountable institutions are key determining factors to bring digital dividends to developing countries. D4D particularly brings with it the need for sound governance regarding the management and handling of data.

56. One should also be aware of the possible tension between governance and innovation. Innovation can be highly disruptive and may involve a transgression of existing norms and interests. There needs to be some tolerance for new models to be explored and preparedness to update the regulatory environment when they prove to be beneficial.

## **Tools**

57. As recommended by Chang (2015), rather than focusing on sector-specific tools, the Belgian development cooperation will pay more attention to platforms and technology that can be used across sectors. In Uganda, for example, an SMS platform for data capture was used in both health and education projects. Interventions also tend to be more successful if they use applications that beneficiaries are already using in their daily lives.

58. Here follows a non-exhaustive list of some common platforms or tools that can be instrumental to implement the priorities of this strategic policy note as outlined above:

- **Digital identity:** electronic identification systems have become effective platforms for securing bank transactions, voting, paying bills, etc. . . (World Bank Group, 2016)
- **Mobile money** is used for money transferring between people to savings and payments for energy, healthcare, etc. which provides people with a financial track record enabling credit and insurance services.
- **Application program interface (API):** a set of routines, protocols, and tools for building software applications and facilitating the sharing of data.
- **Social Media:** fundamental platform for information dissemination during natural disasters and emergencies, encouraging political mobilization and social change. (World Bank Group, 2016)
- **Sensors:** stand-alone sensors or sensors integrated into objects enable the Internet of Things, which refers to objects that are connected to the Internet (UNCTAD, 2014), and are used for remote monitoring of energy provision, maintenance needs, garbage collection, etc.

Through more efficient garbage collection, the garbage trucks can reduce their CO<sub>2</sub>-exhaust and waste treatment can result in better recycling. **Enevo**-founder Pirkka Palomäki achieved this by using sensors that measure when a container is full ([www.enevo.com](http://www.enevo.com)).

- **Smart systems:** connected systems that are able to react to the data that they have collected (UNCTAD, 2014)
- **Geographic information systems** can present a variety of geo-referenced data (e.g. on natural resources, basic services) on a visual map which can be instrumental for remote monitoring, needs/results-based financing, etc.
- **Open-source platforms** and **crowdsourcing** allow people from all over the world to share their experience and to work together on the same projects to get better results in less time and with the minimum costs. (Annunziata, 2015)
- **SMS platforms** and **messaging applications** allow people to share information and advice on a variety of topics.
- **Speech recognition software** allows for interactive voice communication which can be instrumental to widely seek user feedback from illiterate stakeholders.

- **Drones** can help deliver medical or other supplies to remote areas as well as collect visual information for a variety of uses.

**WeFarm** ([wefarm.org](http://wefarm.org)) connects farmers who do not have Internet access with each other. Through the use of SMS they help each other to solve problems such as sick cattle or dry land. Already 52.000 farmers participate, says founder Kenny Ewan from Great-Britain.

59. When choosing an appropriate tool, it is obviously very important to take the constraints of the local context into account (see also 'basic foundations' above). Not all tools can be used everywhere. For example, where access to the Internet and smart phones is limited, it may not be wise to rely heavily on social media. When the digital tools or strategies are highly innovative, it is also important to adopt an iterative approach that allows for sufficient flexibility as implementation and context evolve.

## **V.2. Sustainability**

60. As important as the basic foundations to make an intervention feasible and the tools that allow for change is to build in the components that will allow the intervention's impact to be sustainable over time. This sustainability heavily depends on the local context and requires a case-by-case approach. Here are some of the components which are specific to D4D to take into account.

### **Local ownership and knowledge transfer**

61. Even though digital technology can easily be shared across borders, it is important to strongly involve local actors if we want them to continue using and managing this technology. It is also important to develop local and tailor-made content to make the digital tools and applications more relevant to the local context. When a service is based on local contributors, they need to receive fair compensation in accordance to the social standards to be sustainable.

62. It needs to be clear who owns the digital systems that are set up and who is responsible

for maintenance and problem solving. Users should know how they can communicate these problems. Shared modules of community ownership may provide inspiration. In any case, due attention should be paid to the necessary capacity building support to ensure sustainable local ownership.

63. Even if the intervention is not implemented with the local authorities, it is important to have their buy-in. They need to understand the importance of the intervention and its digital tools in order to minimize the risk of them taking counterproductive measures. An Internet-based application you develop, for example, maybe useless if the authorities deprive you of Internet access.

## **Enabling environment for the local D4D ecosystems**

64. Policy intervention and sound regulatory frameworks are required for digital ecosystems to thrive and be efficient. Ecosystem investments are public goods and do not attract much private investment. (UNCTAD, 2014) Promoting and supporting vibrant digital ecosystems includes support for tech start-ups and incubators and policies facilitating innovation, with respect for social protection provisions. It is also about promoting standards that facilitate interoperability and allow for scalable and cost-effective solutions. (ITU & Cisco, 2016)

**“Alliance for Affordable Internet** brings public, private and not-for-profit sectors together to create policy and regulatory solutions that drive down the cost of Internet access. In less than a year, the Government of Ghana has committed to abolishing import taxes on smartphones.” (Ranger et al. 2015)

65. It is necessary to improve the sharing of knowledge and coordination among donors, programmes and others who may be developing digital tools. This is possible by using sharing platforms (Ranger et al. 2015) and interoperable digital systems, instead of independently developing similar but separate tools or systems which are unable to connect to one another<sup>19</sup>. Sharing knowledge is also about a collective learning process which allows to build evidence on what works and what does not, to readjust approaches when needed and to build capacities over time.

---

<sup>19</sup> The large number of health applications in Uganda had to be taken offline in 2012 due to a lack of central coordination.

BTC invested in Burundi and Senegal in the integration of OpenClinic GA hospital information systems with the national e-Health data warehouse built on DHIS2. Such solution enables to directly extract **aggregate data for national health policy making** from clinical hospital databases without the need for additional (paper based) data collection instruments. Recently, the Ministry of Health of Mali expressed an official request to the Ministry of Health in Burundi to copy the Burundian solution in Mali.

66. The beauty of digital is that sharing or multiplying comes at (almost) no additional cost. Collaboration can therefore not only avoid reinventing the wheel, but also strongly reduce certain infrastructure and maintenance costs (even if it concerns an application or online platform) involved. One should therefore look into joint utilisation to identify a better and flexible value-proposition that is more likely to reach scale and become economically sustainable.

## **Environmental sustainability**

67. There is a need to understand the growing carbon footprint of the ICT sector itself, but also the opportunities it creates to reduce carbon emissions in other sectors and to improve natural resource management through smart applications (e.g. ICT application in climate-smart agriculture). Investment in ICT material and infrastructure will eventually also lead to an increase in e-waste for which the necessary recycling and disposal strategies need to be planned. Effective recycling of e-waste can be ensured, for example, via recycling capacity-building and/or extended producer responsibility. (UNCTAD, 2014)

## **V.3. Risks**

### **Feasibility risks**

68. One should consider a number of risks that directly affect the viability or effectiveness of a planned intervention. An intervention may look perfect on paper, yet prove to be impossible to implement.

## **Human factors**

69. Technology is to be used by people and human behavior might be a limiting factor with reluctance to adopt new technology as a possible concern. (ITU & Cisco, 2016) The World Development Report 2016 speaks of a “race between education and technology”. Apart from a lack of required skills and competencies as mentioned above, there may also be cultural factors that prevent some types of information or technology from being used in certain communities.

## **Financial barriers**

70. In certain low income communities, the costs involved in using digital communication tools may well be the main reason why they are not more widely spread or being used. Development interventions that rely on these tools should therefore look into the different possibilities to overcome these financial constraints.

## **Data ownership**

71. Deepak Mishra found that ‘open data’ are progressing with difficulty. Large telecom and Internet companies who own big data may be reluctant to share because of the fear of jeopardizing customer privacy or corporate competitiveness. (World Bank Group, 2016) Governmental statistical offices may also tightly control development data and subject their publication to strict and lengthy approval procedures. The issue of data ownership and the required conditions to make the data accessible is therefore an important factor to consider. One successful approach to obtaining commercial big data such as mobile call records is for researchers to work in collaboration with government agencies such as regulatory authorities (Njuguna & McSharry, 2016).

## **False assumptions**

72. Interventions that focus on the provision of digital equipment or other related inputs are sometimes based on false assumptions that these resources will logically be used for development purposes. Experience has shown that this is not always the case. Just handing out mobile phones to farmers, for example, is no guarantee that they will use this to access market information. Interventions therefore need to be based on a strong theory of change avoiding unrealistic assumptions.

## **Unintended consequences: the risk of doing harm**

73. 'Do no harm' is one of the principles for aid effectiveness in fragile situations. As digitalization has the potential to bring about an innovative and disruptive development process, the risk for unintended consequences is particularly high and it is important to prevent or properly manage those that have a negative impact. Here follows a non-exhaustive list of some of these risks.

### **Curtailment of Rights**

74. Whereas digitalization can help promote human rights, it can also negatively affect certain rights. Protection of privacy, freedom of expression and opinion, intellectual property rights are particularly at risk. (UNCTAD, 2014) The same infrastructure that enables people to create, store and share information may also jeopardize their privacy and security. These same techniques can be used for large-scale and targeted surveillance by government, giant ICT firms, or a partnership of the two. Abuse of these techniques could turn the 'Information Society' into the 'Surveillance Society', as identity management systems improve without parallel emphasis on anonymity and ownership of personal data (ITU & Cisco, 2016, p.42). Beside surveillance, digital technologies could also allow greater government monitoring and control over citizens through other means such as disseminating propaganda, hacking and disinformation. (UNCTAD, 2014) Governments may also restrict or shut down mobile and Internet communications to prevent social mobilization. It is important to note that technology will often reinforce rather than replace existing accountability relationships between governments and citizens (World Bank Group, 2016)<sup>20</sup>.

---

<sup>20</sup> Where good governance is absent and it is impossible to enhance the necessary institutional capacity, there may be a need to rely on a 'third trusted party' to have proper oversight. DFID did this for mobile transfers of international remittances to Somalia to avoid money laundering or the sponsoring of terrorism.

Data can also be abused by non-state actors for the purposes of land-grabbing, violent conflict and other. This explains that digitalization needs to go hand in hand with the promotion of human rights, rule of law and the establishment of institutions, legislation, policies and procedures that will guarantee these rights and protect people's privacy. It also involves the need to invest in skills development for data protection practices.

## **Vulnerabilities to cybercrime**

75. Cybercrime includes "offences against confidentiality, integrity and availability of information and communication infrastructure"; "computer-related traditional crimes" (such as illicit financial flows, fraud, child pornography, human trafficking, inciting to violence and terrorism); "content-related offences"; "offences related to infringements of copyright and related rights". High usage of the Internet enhances one's vulnerability to those crimes. The costs of cybercrimes are economic, political and social. (UNCTAD, 2014) It is therefore important to extend conventional crime legislation to cover online activity and new forms of crime as listed above.

## **Market distortion**

76. "Vested business interests, regulatory uncertainty and limited contestation across digital platforms can lead to harmful concentration in many sectors" (World Development Report 2016, p.5) and the emergence of info-monopolies, involving the risk that data are increasingly in private hands and become too expensive to access. Digital technologies could potentially increase dependency on certain providers (UNCTAD, 2014) and certain patents on digital applications can be very costly. There is a need to manage this risk<sup>21</sup> when collaborating with private sector companies and to ensure a level playing field between actors.

77. There are also likely to be disruptions in the human resources market. New business models (e.g. the uber-story) can make older ones obsolete with some people losing their jobs<sup>22</sup> and possibly social unrest as a result. The risk of brain drain has also already been mentioned above.

---

<sup>21</sup> The Market Access Advisory Committee (MAAC) of the EU, in which Belgium participates, can be an interesting partner for questions related to market barriers in the digital sector.

<sup>22</sup> See also §37 (p. 25).

There is for example a geographical concentration of data scientists in developed countries so that people who have the appropriate skills to manage data in developing countries are moving to developed countries (Institute of Development Studies, 2015). When investing in human capital development, it is therefore also important to ensure that the incentives are in place to utilize these capacities locally or in-country.

## **New factors of exclusion**

78. Even whilst specifically aiming to foster greater inclusion in a certain area, the introduction of digital tools may also create new barriers and lead to exclusion in another area. Digital illiteracy can lead to a widening gap between the beneficiaries that can use the digital tools to their advantage and those that cannot. This confirms the need again to complement digital interventions with offline strategies that help ensure that no one is left behind.

## **V.4. Partnerships**

79. Partnerships are essential here for the Belgian development cooperation for two main reasons. The first reason is the need to work jointly towards common D4D-priorities in order to reach a significant and sustainable impact. The second reason is to adopt some division of labor so that each partner can focus on its area of strength and complement one another as part of a common vision on development.

80. The actors of the Belgian development cooperation include BTC<sup>23</sup>, the Belgian Development Agency, for the implementation of the governmental country programs; BIO<sup>24</sup>, the Belgian Investment Company for Developing countries, for investments in the private sector, and the actors of the non-governmental cooperation (Belgian civil society organizations and institutional actors). The Belgian government will, collectively with these actors, and within the framework of their mandate and procedures, implement this strategic policy on D4D. The paragraphs below explain the specific focus that will be given to other and additional partnerships regarding D4D.

---

23 See also [www.btctb.org](http://www.btctb.org)

24 See also [www.bio-invest.be](http://www.bio-invest.be)

## **The European development cooperation**

81. Belgium and many other European member states encourage the European Commission to also engage in D4D as an important policy priority. The European development cooperation has a distinct comparative advantage to promote an enabling regulatory policy framework in the partner countries that makes it more attractive for the private sector to invest in D4D. Belgium will also encourage them to continue their support to connectivity infrastructure in areas where the private sector is absent (i.e. the so called last mile coverage)<sup>25</sup>. The European Commission is equally asked to integrate digital as a cross-cutting enabler in their sector programs.

82. The European Commission also has an important role to play to facilitate knowledge sharing and coordination on D4D within the EU institutions, between member states and partners such as private sector companies and civil society organizations.

## **Multilateral partner organizations**

83. Belgium's multilateral partner organizations are all engaged in D4D in one way or another. There is demonstrated potential to utilize digitalization as an enabler in all areas that correspond to their respective mandates, whether it concerns agriculture and food security, health, education, social protection, enterprise development, capacity building, tax administration, migration, women empowerment, human rights, environment or other areas. These partner organizations are at different phases in their strategic development process on D4D. Belgium will encourage them to progress in that regard and can share information, suggestions and examples. Belgium will also ask them to provide information on the progress they make in this area as part of the regular reporting mechanisms.

UN Women supports **MediCapt**, which is a mobile application, under development by the Program on Sexual Violence in Conflict Zones at Physicians for Human Rights, to help clinicians more effectively collect, document, and preserve forensic medical evidence of sexual violence to support the local prosecution of these crimes. This critical tool converts a standardized medical intake form for forensic documentation to a digital platform and combines it with a secure mobile camera to facilitate forensic photography.

<sup>25</sup> This corresponds to target 9.C. of the SDGs which is to: 'Significantly increase access to ICT and strive to provide universal and affordable access to the Internet in least developed countries by 2020'.

84. The World Bank is a key partner regarding D4D as their World Development Report 2016 has provided them with strong guidance in this area. The size of their programs and investments also allows the World Bank to deal with some of the basic development challenges for D4D such as the required connectivity and infrastructure (in partnership with the private sector), national policies, regulations and institutional capacities. This is also true for the African Development Bank.

85. The Belgian development cooperation can also support other multilateral organizations for specific programs through delegated cooperation or call for proposals. Some organizations possess strengths and specific expertise in areas that are central in this strategic policy note such as digital for inclusive finance (e.g. the United Nations Capital Development Fund - UNCDF, the International Fund for Agricultural Development – IFAD) and digital for inclusive economic growth (e.g. the United Nations Conference on Trade and Development - UNCTAD and its International Trade Centre). PARIS21, the Partnership in Statistics for Development in the 21st Century, which is hosted by the OECD, aims to reduce poverty and improve governance in developing countries by promoting the integration of statistics and reliable data in the decision-making process. United Nations Global Pulse is an initiative of the United Nations Secretary-General aiming to accelerate discovery, development and scaled adoption of big data innovation for sustainable development and humanitarian action. Both PARIS21 and UN Global Pulse relate very closely to the Belgian strategic priority of Better use of (big) data, as mentioned above, and it is therefore valuable to explore opportunities for collaboration at country level. ITU, the United Nations specialized agency for ICTs, has a Telecommunication Development Sector (ITU-D) for the delivery of technical assistance and the creation, development and improvement of telecommunication and ICT equipment and networks in developing countries, which can also be a crucial component in the Belgian programs to implement this strategy.

## **Humanitarian organizations**

86. Most of Belgium's humanitarian partner organizations already make good use of digitalization in their work and often in partnership with private sector companies. As they work in emergency contexts and strive for maximum efficiency, digital is particularly helpful and becoming indispensable. Their strategies for digitalization tend to focus on internal operations, external communications as well as on the delivery of humanitarian relief and other support to communities.

87. Digital tools are used to improve data collection, like the World Food Program's project entitled «Mobile Vulnerability Analysis and Mapping» or mVam, of which Belgium is one of the main donors. mVam helps source timely information on food security through SMS surveys and phone interviews. In Iraq, 1,500 monthly mVAM surveys benefit over 2 million people in need. Digitalization also enables urgent aid provision in certain contexts where access is difficult, such as cash transfers through SMS, e-transfer cards (eg. OneCard in Lebanon) and biometric identification.

**Norad, Norway's development agency** launched a competition for gamers and app-developers to collaborate with several private partners including Facebook, Orange and a Norwegian university. The app they develop, named **#eduApp4Syria**, enables Syrian parents to teach their children how to read in the (temporary) absence of schools and teachers in the refugee camps.

88. Belgium will encourage its humanitarian partner organization to continue along those lines, whilst taking into account the ethical use of new technologies in a humanitarian setting.

### **Private sector companies**

89. As much as it is true for the SDGs in general<sup>26</sup>, private sector companies have an important role to play in the area of D4D. They bring technology and innovation, expertise, investment, risk management, sustainable business models and wealth creation when they can participate in a transparent and competitive business environment. There are different ways to involve private sector companies in development, of which the following will be particularly focused on by the Belgian development cooperation in the area of D4D:

### **Goods and services**

90. Development interventions purchase goods and services from private sector companies. When public funds are used, this is done according to standard public procurement regulations.

---

<sup>26</sup> See "Charter on the role of Private Sector, Civil Society and Public Sector in advancing the Sustainable Development Goals for Belgian development cooperation".

In order to seek the potential of the latest innovations, it is important to be aware of the different solutions that exist<sup>27</sup> when specifying the terms of the tender. Keeping the terms concrete can help attract more innovative solutions. When published, it is equally important that a large number of potential providers is informed of the opportunity. The Belgian development cooperation therefore encourages all of its implementing partners to also disseminate their tenders through the application Trade4U from the Belgian Foreign Trade Agency.

## **Sustainable and social entrepreneurship and investment**

91. Development challenges can sometimes be transformed into profitable business opportunities for companies to contribute to economic, social and environmental prosperity, and this is especially true in the area of D4D. The Belgian development cooperation will therefore help introduce private sector companies to interesting opportunities in the partner countries. These opportunities include, but are not limited to, partnerships between private sector companies and the government of the partner country (Public Private Partnerships) whereby the government gives a long-term concession to a private company to provide quality services on behalf of the government. The role of the Belgian development cooperation involves communication and awareness raising, organizing innovation workshops and opportunities for networking, taking companies along on field visits and introducing them to the local D4D ecosystem through forums, videoconferences etc.

The private Belgian company **Zetes** has extensive experience with Public Private Partnerships in Africa. They typically use this model to provide identification documents such as eID-cards, e-passports, driving licenses or e-health cards, whereby the government determines the rules and the quality of the products and level of service. Zetes takes care of the investments, creates local employment, transfers know-how, handles the industrial risk and ensures timely delivery of the security products. User fees are generally paid through a bank which channels the financial flows to the different accounts: fiscal revenue to treasury, fees to the local partners for their expenses and the fee to Zetes allowing them to earn back the investment over time (usual timespan of 5 to 15 years).

---

<sup>27</sup> See below on the Belgian D4D ecosystem for how this will be promoted (§96 et seq.).

92. In the initial phase, the private sector may need to be supported where there are insufficient incentives for them to invest or where the required basic conditions to allow for such an investment are lacking (e.g. in remote areas). Such support should be clearly oriented towards development goals and is best provided in a results-based manner. The Belgian development cooperation has to expand its instruments<sup>28</sup> in order to be able to provide such support for local and possibly also international companies to set up a D4D business model.

## **Enabling business environment**

93. The partner countries of the Belgian development cooperation face several challenges resulting in a difficult and risky business environment. The Belgian development cooperation will therefore contribute to improving the policy, regulatory and basic infrastructure framework, helping stimulate local demand and human capital development for a more enabling business environment in the area of D4D. This will primarily be done through policy dialogue, multilateral partnerships and focused bilateral interventions. By acting responsibly and abiding to the regulations in place, companies will in turn enhance their reputation, reduce business risks and strengthen the local institutional structures. Larger private companies often invest in local human capital development and should be encouraged to do so in partnership with other development actors.

## **Local private sector development**

94. Sustainable business models and D4D solutions often rely on a vibrant local private sector, which in turn contributes to more inclusive economic growth. Local start-ups need to be supported through incubators and coaching. International companies can be involved for knowledge transfer and may be willing to contribute through corporate volunteering. The actors of the Belgian development cooperation will seek to engage talented local suppliers and service providers.

95. Larger profitable local businesses can seek technical assistance and investment support from BIO in areas such as digital finance and connectivity or energy infrastructure. This can help them scale-up.

---

<sup>28</sup> With respect of the intervention criteria as listed in the Strategic policy note "The Belgian development cooperation and the local private sector: supporting sustainable human development."

## **The Belgian D4D ecosystem**

96. Belgium ranked 5th among EU countries in the Digital Economy and Society Index (DESI) 2016. This capacity, however, does not automatically feed into Belgium's efforts for international development. It is therefore important to connect the different actors that are involved in digital in order to allow for an exchange of ideas, tools and expertise and in order to continuously reach out to possible new partners for D4D.

97. The Belgium development cooperation will support the creation and actively engage in the operation of a platform that provides a space for networking among all Belgian actors interested in D4D (government and non-government actors, private sector companies, trade agencies, universities and research centers, informal groups and networks). This platform should help the Belgian development actors identify digital solutions for their development interventions and it should allow for the sharing of contacts, best practices, lessons learnt and evidence on D4D. The platform itself should make the most out of using modern technologies<sup>29</sup> in order to involve its members/users in the most efficient way. It is expected that this platform will be a driving force for the implementation of this strategic policy note.

98. As much as private sector players are obliged to innovate to stay alive, it is also needed to support innovation in development in order to 'stay ahead of the game' in this quickly evolving context. (Chang, 2015) The Belgium development cooperation will therefore support awards, such as the Prize for D4D of the Royal Museum for Central Africa, and other activities proposed by the Belgian development actors that encourage innovation.

99. There is also a need to look beyond the Belgian context. A strong Belgian D4D ecosystem should connect to European<sup>30</sup> and International platforms. This is important to share information, knowledge and experiences, to promote interoperability at a broader level, as well as to engage in international and global initiatives (such as global data platforms on the achievement of the SDGs)<sup>31</sup>.

---

29 For example by using a 'wiki' to map best practices (<https://en.wikipedia.org/wiki/Wiki>)

30 An online public platform has recently been set up at <http://capacity4dev.ec.europa.eu/ict4dev/>

31 Belgium should consider becoming a champion of the Global Partnership for Sustainable Development Data ([www.data4sdgs.org](http://www.data4sdgs.org))

## V.5. Strategic management

### **Funding**

100. Given that digitalization is to be treated as an enabler, and not as a goal, and given that it can play an important role in all of the sectors where the Belgian development cooperation is active, there will be no separate fund created for the implementation of this entire strategy. Crosscutting priorities such as D4D are best financed using the existing funding mechanisms, as it will allow for their broad horizontal implementation and for synergy in achieving the objectives of all programs and interventions. Existing funding mechanisms should not prevent the actors of the Belgian development cooperation to also look into innovative financial sources<sup>32</sup>, such as crowdfunding and private sector investment, and to enhance domestic resource mobilization as official development assistance should be used to leverage a broader resource base.

101. Such a crosscutting approach does not exclude the opportunity to stimulate specific initiatives in this area by integrating D4D as one of the selection criteria in calls for proposals. This can be particularly useful in areas where the opportunities of digitalization are not naturally taken advantage of. In order to avoid treating D4D as a goal, it is important here to tie the call to one or several of the SDGs, such as promoting women's empowerment.

102. In order to contribute directly to building some of the basic foundations needed for D4D such as connectivity infrastructure, an enabling regulatory and institutional environment and skills development, Belgium may also consider contributing to dedicated trust funds managed by the EU or multilateral organizations.

### **Implementation**

103. This strategic policy note is only useful if it is referred to in practice. Beside its broad dissemination to all of the actors of the Belgian development cooperation, a number of concrete mechanisms for its use are therefore listed below:

---

<sup>32</sup> The international non-profit organization Kiva demonstrates how new sources for microfinance can be mobilized through digitalization (see [www.kiva.org](http://www.kiva.org))

- a. DGD, BTC and BIO should each present this strategic policy note to all relevant staff internally and organize debate and exchange on its implementation; other actors and partners of the Belgian development cooperation are encouraged to do the same;
- b. BTC organizes Digital Talks to raise more in-depth awareness on D4D and Digital Tours to identify concrete opportunities in the partner countries; they also develop digital toolboxes to help integrate D4D in its programs and develop partnership agreements with other public actors such as FEDICT to collaborate on D4D;
- c. DGD in collaboration with B3 and B2 and the regional agencies for foreign trade, as well as the Belgian diplomatic posts, will proactively introduce interested private sector companies to opportunities with the Belgian development cooperation to engage in D4D;
- d. DGD will develop the specific modalities for a new financial instrument to partner directly with private sector companies on D4D where there is a need for such an incentive;
- e. This strategic policy note should be presented and serve as a basis for debate and ongoing exchange on its implementation at meetings of the Forum of the Actors of the Belgian Development Cooperation in each of the priority partner countries; it can also be a basis for exchange in multi-donor forums to promote division of labor and develop a coordinated approach;
- f. D4D should be looked at as part of every context analysis, program or project appraisal process and this will be integrated in the templates used; information on D4D implementation – including how risks and negative consequences such as e-waste are managed - subsequently also has to be provided as part of the reporting procedures, and therefore integrated in the reporting formats;
- g. Supportive bilateral programs such as the capacity development / scholarship program and the program for studies and expertise should pay sufficient attention to the support in terms of skills development and innovation as required by the specific context; when designing a new bilateral country program, the opportunity to include a dedicated supporting facility for D4D skill development, data management and innovation should be considered;

- h. Belgium will jointly with other European member states continue to request the European Commission to develop a Staff Working Paper on D4D in order to fully integrate D4D in the European development cooperation and to promote a European partnership with private sector companies in this area;
- i. This strategic policy note will serve as a basis for Belgium's intervention and position at international fora and in dialogue with our multilateral and humanitarian partner organizations; Belgium will foster alliances with other donors and member states on D4D in order to maximize our impact in those organizations' board discussions on budgets, programs and specific initiatives to promote D4D (e.g. research and publications);
- j. D4D will be integrated in the external communications activities of the Belgian Federal Public Service for Foreign Affairs and its diplomatic posts: Glo.be-magazine, diplomatie.be-web site and social media; DGD will also promote its integration in the development education activities financed in Belgium in dialogue with the non-governmental partners and via the calls for proposal for such activities;
- k. The Belgian D4D platform (see above) will play a crucial role to promote the development of partnerships and sharing of information, expertise and lessons learnt that allow for the implementation of this strategic policy.

## **Monitoring**

### **D4D tagging in the Belgian ODA database**

104. In order to monitor this new policy priority across all interventions, an extra field will be added in the Belgian ODA database tagging the interventions that integrate the strategic D4D priorities. This means that there are three options of which one or more can be marked when applicable:

- 1) Better use of (big) data
- 2) Digital for inclusive societies
- 3) Digital for inclusive and sustainable economic growth

105. Tagging the D4D priorities in the Belgian ODA database will not only allow to identify the interventions that address them, but will also give an idea of which priorities receive more or less attention. This information will be made openly available by adding it to the data that are published by the Belgian development cooperation according to the IATI<sup>33</sup> standard. It can also feed into more detailed mapping exercises at sector or country level. It will also allow to some extent to analyze the link between digitalization in the Belgian development cooperation and the SDGs. Do note, however, that this tagging remains a limited tool that does not provide any information on how well D4D is put in practice. Such a value assessment will need a more rigorous, in-depth evaluation where it is not a matter of inputs used (such as the percentage of the budget spent on digital equipment), but of better results achieved through digitalization.

## **Field visits**

106. Regardless of the type of development intervention (e.g. bilateral, non-governmental, multilateral, humanitarian, private sector support) that is visited by DGD or Embassy staff, it is important during the field visit to pay due attention to how D4D is being implemented. Based on the priorities of this strategy, a simple questionnaire will be developed to guide these visits and to collect information in a structured way. Findings from the analysis of this information can subsequently be shared in the country Forum of the Actors of the Belgian Development Cooperation and in the Belgian D4D platform.

## **Impact evaluations**

107. As this strategy focuses on digitalization as an enabler to enhance the impact of our development interventions, it is important to measure to what extent this impact increases as the strategy is put into practice. Therefore, where possible a number of impact evaluations will be integrated right from the planning phase into D4D-interventions in order to provide us with evidence and lessons learnt on the added value that digitalization has in terms of development impact. Note, however, the methodological challenges that exist to attribute differences in impact to digitalization and the great variety of digital tools which may limit the possibility to formulate generalizable findings.

---

<sup>33</sup>The International Aid Transparency Initiative (see also <http://iatistandard.org/>)

## **Review**

108. D4D is quickly evolving as new technological solutions are developed and as more and new evidence becomes available on what that means for development. It is necessary to adjust this strategic policy accordingly. A review will therefore be conducted after two or three years of implementation, using new documentary sources, the observations from field visits (see above) and (impact) evaluations (if available). Drawing on the ODA-database, the evolution of how the D4D strategic priorities are integrated in the Belgian development cooperation will be analyzed and stakeholders consulted on the implementation of this strategic policy. The review will provide recommendations on how this strategic policy should be adjusted where needed.



# References

- Annunziata, M. 2015. The future of work in the developing world. Prepared for the 2015 Brookings Blum Roundtable.
- Bernholz, L. 2015. Digital resources for civil society.
- Better Than Cash Alliance, 2015. Research Factsheet.
- Chang, A.M. 2015. Foreign Assistance in the Digital Age. Prepared for the 2015 Brookings Blum Roundtable.
- Faye, M. and Niehaus, P. 2015. Ending poverty with electronic payments, Prepared for the 2015 Brookings Blum Roundtable.
- Institute of Development Studies, 2015. Ensuring developing countries benefit from big data, Policy Briefing, Issue 107, December 2015.
- International Telecommunication Union – ITU, 2016. [www.itu.int/en/sustainable-world/Pages/goal8.aspx](http://www.itu.int/en/sustainable-world/Pages/goal8.aspx)
- International Telecommunication Union – ITU and Cisco Systems, 2016. Harnessing the Internet of Things for Global Development, A contribution to the UN Broadband Commission for Sustainable Development.
- Martin, C., Harihareswara, N., Diebold, E., Kodali, H. and Averch, C. 2016. Guide to the use of digital financial services in agriculture, USAID and mSTAR, Updated February 2016.
- McKinsey & Company, 2014. Offline and falling behind: Barriers to Internet adoption.
- Mishra, D. 2015. Will the spread of digital technologies spell the end of the knowledge divide? Prepared for the 2015 Brookings Blum Roundtable.

- Njuguna, C. and McSharry, P. 2016. Constructing spatiotemporal poverty indices from big data. Carnegie Mellon University Working paper.
- Paradi-Guilford, C. and Khomyn, M. 2016. [blogs.worldbank.org/ic4d/how-coding-bootcamps-are-helping-tackle-youth-unemployment?ICID=TAI\\_TT\\_ICT\\_EN\\_EXT](https://blogs.worldbank.org/ic4d/how-coding-bootcamps-are-helping-tackle-youth-unemployment?ICID=TAI_TT_ICT_EN_EXT)
- Ranger, P., Chandler, J. and Arscott, B. 2015. DFID Review of Digital in Development Programmes, Presented to DFID Digital Steering Committee. Edited for external publication. Department for International Development - UKAID, February 2015.
- Robin, N., Klein, T., Jütting, J. 2015. Public-Private Partnerships for Statistics, Lessons Learned, Future Steps. A focus on the use of non-official data sources for national statistics and public policy. Paris21 - Partnership in Statistics for Development in the 21st Century, Discussion Paper No. 8, December 2015.
- Ross, A. 2015. Networking the world for global opportunity, Prepared for the 2015 Brookings Blum Roundtable.
- Stuart, E., Samman, E., Avis, W., Berliner, T. 2015. The Data Revolution, Finding the Missing Millions, Development Progress, Overseas Development Institute, April 2015.
- The Earth Institute Columbia University and Ericsson, 2016. ICT and SDGs, How Information and Communications Technology can Accelerate Action on the Sustainable Development Goals.
- Third international Open Data conference, 2015. Enabling the Data Revolution, An International Open Data Roadmap, Conference Report.
- UNCTAD, 2014 (draft). Digital Development. Issues Paper for the Commission on Science and Technology for Development 2014-15 Inter-sessional Panel, Geneva, November 26th-28th, 2014 Commission on Science and Technology for Development.

- UNDP, UNFPA (co-coordinator), UNOPS, UNICEF, UN-Women and WFP (co-coordinator), 2016. Big data and the Sustainable Development Goals. Background paper prepared jointly for the Joint meeting of the Executive Boards of UNDP/UNFPA/UNOPS, UNICEF, UN-Women and WFP on 3 June 2016.
- Verdi, 2015. [www.epsu.org/article/arbeit-work-40-about-values-solidarity-and-decent-work-digital-age](http://www.epsu.org/article/arbeit-work-40-about-values-solidarity-and-decent-work-digital-age)
- Wladawsky-Berger, I. 2015. Will the digital revolution deliver for the world's poor? Prepared for the 2015 Brookings Blum Roundtable.
- World Bank Group, 2016. World Development Report 2016: Digital Dividends. Overview.



**Federal Public Service Foreign Affairs,  
Foreign Trade and Development Cooperation**

Rue des Petits Carmes 15  
1000 Brussels  
Belgium

Tel. +32 2 501 81 11

[www.dg-d.be](http://www.dg-d.be)

Responsible editor: Dirk Achten  
President of the Committee of Management  
Rue des Petits Carmes 15  
B-1000 Brussels

September 2016



**KINGDOM OF BELGIUM**

Federal Public Service

**Foreign Affairs,**

**Foreign Trade and**

**Development Cooperation**