

Disruptive Technologies for Private Sector Development in the Democratic Republic of the Congo

Research summary

May 2019

Country

Democratic Republic of Congo

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This is a summary of a research paper produced for the UK Department for International Development's (DFID's) private sector development programme in the Democratic Republic of Congo (DRC). A series of research papers, research summaries, and 'learning briefs' are being published by the programme's Decision Support Unit, with the aim of sharing information that will help others working on similar projects. To read more and to sign up to our mailing list go to <http://bit.ly/PSDinDRC>

Introduction and overview

This is a summary of a 'rapid assessment' research study undertaken for the DFID DRC private sector development programme. The study provides an insight into how new technologies should be promoted to support development of the private sector in the DRC. It does not describe or recommend specific technologies but rather sets out theoretical considerations, as well as empirical evidence showing why technologies cannot be copied and pasted from one context into another. It shows the network of interconnected support that allows technologies to function in a new context, and sets out how 'innovation systems' can be strengthened.

To that end, the study addresses the following research questions:
What does the literature say about technological change and the use of disruptive technologies in supporting private sector development?
In what circumstances has support for technological change and the use of disruptive technologies achieved an improved business environment and enhanced private sector development? What other factors beyond the technologies themselves need to be taken into account when aiming to promote technologies to facilitate private sector

The full version of the report can be downloaded at www.bit.ly/DisruptiveTechFULL

The impact of disruptive technologies in developing countries

There has been a massive technological shift in recent years on a global level that will undoubtedly have consequences for developing countries' economies. Some believe that these emerging new technologies, also known as frontier technologies, will help us overcome development challenges that we have not, to date, been able to tackle. A 2016 report by the Institute for Development Studies (IDS) describes 10 'Frontier Technologies', which have the 'potential to positively contribute to development and humanitarian efforts' (Ramalingam et al., 2016:15). These are presented in Figure 1, organised into five technology groups.

Figure 1: Five areas of frontier technologies



Source: Ramalingam et al. (2016)

The IDS report also sets out four pathways through which frontier technologies can contribute to social, economic, and political development gains:

- driving innovations in business models, products, and processes that provide new goods and services to ‘bottom of the pyramid’ consumers;
- providing means by which better use can be made of existing under-utilised household and productive assets;
- catalysing increases in demand, nationally and internationally, which create new industries and markets, leading to macro and microeconomic growth;
- and changing demand for labour and capital, leading to direct job creation and transformation of the workforce.

However, evidence on how digital technology supports economic growth and poverty reduction is ambiguous. While there certainly is a correlation, the causal link has not been established. In other words, the available evidence does not allow us to conclude that digital technologies, like internet access or mobile telephony, have significantly contributed in their own right to economic growth or poverty reduction.

In addition, ‘there is a problem with the focus on frontier technologies, such as automation, AI and additive technologies, when non-frontier technologies are also highly important to many developing countries.’ (Salam et al., 2018a:13–14).

Furthermore, transferring such technologies to developing countries – and in particular fragile and conflict-affected states (FCAS) – remains challenging.

Rather than focusing on the transfer of specific technologies to solve development problems a more broad-based, systemic, approach is needed. An ‘innovation systems approach’ can strengthen the technological capabilities of developing countries like the DRC.

CASE STUDY – DFID’s Frontier Technology Livestreaming

Frontier Technology Livestreaming is a three-year programme designed to help DFID apply frontier technologies to development challenges. The project has just concluded the selection of the fourth cohort of projects it will support, including projects such as a multipurpose drone platform for Malawi, e-commerce platforms serving remote businesses in Nigeria, and seasonal cold storage with a flexible-access model in Zambia.

After the first two years, the initiative has identified six challenges in promoting frontier technologies in developing countries. Most of these lessons point towards the need for a more systemic approach to technological change, supplementing the introduction of specific innovations so the latter can have a more sustainable impact:

1. Regulatory barriers: a non-favourable regulatory environment – such as one that is non-existent, does not keep pace with technological change, is difficult and costly to engage with, and so on.
2. Supply chain infrastructure: supply chain infrastructure is insufficient to support the technology operating at scale.
3. Skills infrastructure and ecosystem: a shortage of technical skills for the local installation and maintenance of technology, or a lack of a local ecosystem to develop and sustain the technology.
4. Fitting into existing systems: the technology is not a fit for existing planning, decision-making, execution, or implementation systems in the country or domain area.
5. Sustainability post the pilot stage: the technology use case is not sustainable post the pilot stage, either through donor funding, private investment, government take-up, or commercial revenue.
6. Awareness building: the end user (person or organisation) is not aware of the technology or its benefits.

An innovations systems approach

Innovation is complex and systemic. Rather than being solely driven by innovators and firms, innovation is a product of the range of structures – economic, political, and social – in which they are embedded.

Entrepreneurs and individuals often innovate because they have to. They are not only pressured by competitors, but also by increasingly demanding customers, and the availability of or access to equipment.

Hillebrand, Messner, and Meyer-Stamer (1994) argue that the capability to innovate is built on four pillars:

- **The skill of producers in imitating and innovating.** This is largely dependent on pressure to compete, as well as pressure to collaborate with each other.
- **The economic, political, administrative, and legal framework conditions that provide incentives to develop technological capability.** In the past, it was often not recognised that these incentives are lacking in many developing countries.
- **Direct support by state institutions or other organisations** – to disseminate technical and expert knowledge between different actors and industries.
- **Indirect support by the public and private educational systems.** In addition to a sound basic education, it is important that technical training is available at secondary school and in the universities.

A single firm may, in the short to medium term, manage to get a new technology into the market on its own. However, to sustain its position, it will sooner or later need to tap into the education system, the knowledge networks of intermediaries and technology experts, or supplier networks. It is not enough to have a handful of companies that are able to innovate and explore new technological applications.

A systematic approach to innovation in FCAS

There are a number of additional factors in a FCAS that add complexity and make a 'systems approach' even more essential. For instance, sources of information, suppliers, or knowledgeable workers may be hard to identify. A lack of adequate market-supporting institutions – to overcome market failures, trust issues, and coordination and search costs – can incentivise trade in simpler goods and services. In any case, the costs of coordinating more difficult economic activities are often too high. Without addressing these wider factors, it is difficult to establish innovations or new technologies.

CASE STUDY – ÉLAN RDC

The full 'rapid assessment' research study undertaken for the DFID DRC private sector development programme, which the present document summarises, picks out some successful examples of organisations promoting technology in rural development and says that these examples stand out because when they transfer a technology, they do not focus on the technology in a narrow way: they pay careful attention to building local capacity to support, promote, and even further develop the technology and complementary capabilities. Not only do they implement the technology transfer and capability building at multiple levels, but also from multiple perspectives. For instance, attention is paid to policymakers and regulations, technology extension, capacity building, and further research (both technical and more socio-political), while at the same time raising awareness, demonstrating the technology, and strengthening suppliers.

In the DRC, the DFID private sector development project ÉLAN RDC has taken this approach. In the case of its renewable energy intervention, it built a market, including a distributing network and funding models, for newly introduced technologies like solar lamps. In the case of branchless banking and mobile money, it built on an emerging new technology (mobile internet) to develop new services for its target population.

Conclusions and recommendations

The research study undertaken for the DFID DRC private sector development programme makes the case for moving from a sole focus on the transfer of specific technologies to facilitate private sector development, to a more systemic approach involving various actors and institutions in developing countries. More concretely, it recommends the use of an innovation systems approach to strengthen the technological capabilities of developing countries like the DRC.

So, how do you strengthen innovation systems? The study makes the following recommendations for those looking to increase the positive impacts that technological innovations can have on the private sector in FCAS:

1. Take care when selecting a specific technology. Understand why uptake has not occurred naturally, and what technological capabilities are required to fully leverage, adapt, and further deploy the technology. Finally, look at which of these capabilities already exist or must first be developed.
2. In contexts that are constrained by severe market and structural failure, technologies that overcome market and government failures should be prioritised, such as those that:
 - improve or substitute for a lack of basic physical infrastructure, such as electricity supply, basic education, clean water, or adequate healthcare; or
 - reduce high coordination costs, or that are unlikely to be adopted by the actors on their own because of high coordination costs.
3. Building technological capability could include collaborating with regional and international research groups and universities.
4. Instead of only looking sub-nationally for scale consider leveraging regional programmes and organisations like the [African Enterprise Challenge Fund](#). Donors can use their regional presence to broker linkages with equipment and knowledge providers. They can also facilitate access to trade fairs, licences, and market access opportunities.
5. Finally, but perhaps most importantly, ensure that interventions are adaptive in their approach and have the capability to swiftly assess whether projects are successful and need to be amplified, or are failing and need to be closed down (and learned from).

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