



Unlocking Public and Private  
Finance for the Poor



MAY 2021

# MAKING DIGITAL WORK

Applying a Market Systems Development  
Approach to Build Inclusive Digital Economies

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# ACKNOWLEDGEMENTS

*This publication compiles insights from an inception study on Using a Market Systems Development Approach and Digital Solutions to Address Constraints in different sectors Sectors in Uganda and how the United Nations Capital Development Fund (UNCDF) has used the findings of this study to set the strategy for its programme focused on building an inclusive digital economy.*

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# TABLE OF CONTENTS

Acknowledgements .....	3
Executive summary .....	5
<b>1 Applying a Market Systems Development approach for inclusive digital economies</b> .....	<b>6</b>
1.1 MSD in the context of UNCDF strategy .....	7
1.2 Catalytic impact .....	7
1.3 Flexibility in responding to changing market constraints .....	7
1.4 Recalibrating for the COVID-19 pandemic .....	7
<b>2 MSD prioritization framework</b> .....	<b>9</b>
2.1 Subsector selection .....	10
2.2 Market systems analysis, diagnosis and strategy development .....	11
2.3 Mapping market structure and performance .....	11
2.4 Identifying innovation leverage points .....	13
<b>3 Addressing socio-economic challenges with the MSD approach</b> .....	<b>14</b>
3.1 Agriculture .....	15
3.2 Health .....	21
3.3 Education .....	28
3.4 Digital sector .....	32
<b>4 Monitoring and Measurement</b> .....	<b>40</b>
<b>5 Lessons learned from applying the MSD approach</b> .....	<b>45</b>
Conclusion .....	47

# EXECUTIVE SUMMARY

In line with its strategy 'leaving no one behind in the digital era', UNCDF, with the support of Sweden, aims by 2024 to empower at least one million Ugandans in rural communities to use services that leverage innovation and technology to contribute to the achievement of the Sustainable Development Goals (SDGs). The strategy, focused on "building inclusive digital economies", aims to harness the power of digital tools in building sustainable livelihoods for underserved communities.

In the first year of implementing this strategy (2019), we asked the key stakeholders and ourselves how we could help address some of the most challenging market dysfunctions in the agriculture, digital, education and health sectors.

To get more insight into this, UNCDF carried out an inception study to understand selected market systems of the target sectors, to identify how to appropriately address underlying market constraints using digital interventions that lead to improved efficiency, effectiveness and sustainability.

**By using the Market Systems Development (MSD) approach, UNCDF seeks to:**

- leverage the role and behaviour of players in the marketplace while supporting them to innovate, and improve on their current initiatives
- strengthen systems and relationships among the various market actors.

From the outset, UNCDF recognized that improving the lives of the poor – that is, stimulating growth and expanding access – means transforming the systems around them that restrict access and block growth. We were also cognizant of several pre-existing research studies and analyses on the programme target sectors on how digital innovation can create impact for vulnerable communities.

Additionally, we recognized that the MSD approach has in the past two decades emerged as a better way to deliver development that transforms the socio-economic livelihoods of disadvantaged people.<sup>1</sup>

Consequently, UNCDF sought to build on existing work in this space to assess what and how digital solutions can help in alleviating market constraints.

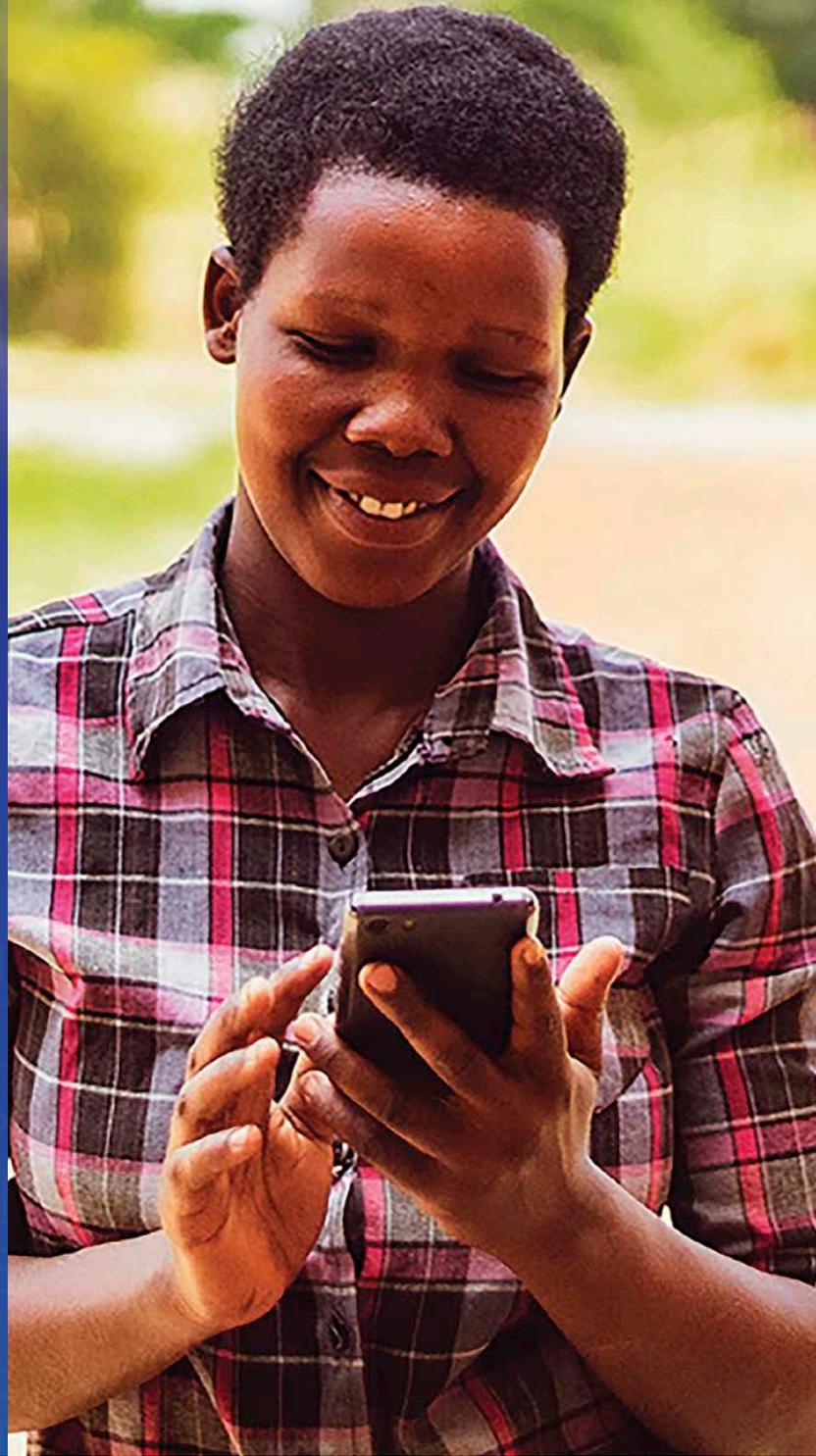
Beyond the insights gained into the market systems that influence the agriculture, education and health sectors in Uganda, this report also highlights the methodology used by UNCDF to identify key constraints in the access to and usage of digital platforms by underserved communities in various market systems in the country. The report provides insights on how market dysfunction and underlying constraints in the real economy sectors (i.e. production, purchase, and flow of goods and services within the general economy) are impacted by the digital economy.

This process has taught us one important lesson: that we cannot ignore the significance of using a **coherent approach** to understand and intervene in the **right market systems** with the **right interventions** to ensure that markets function more efficiently and sustainably for targeted segments of the population. Market diagnostic is an ongoing process in an MSD project, and the inception study is the first step in that direction.

<sup>1</sup> Swedish International Development Cooperation Agency (Sida), *Evaluation of the Market Systems Development Approach: Lessons for Expanded Use and Adaptive Management at Sida*, vol. 1, *Evaluation Report*, Sida Evaluation (Stockholm, 2018:2a).

# 1.

## APPLYING A MARKET SYSTEMS DEVELOPMENT APPROACH FOR INCLUSIVE DIGITAL ECONOMIES



*The UNCDF programme on building an inclusive digital economy is focused on ensuring that vulnerable communities are not left behind in the digital era.*

In implementing this programme, UNCDF has chosen to adopt a Market Systems Development (MSD) approach for two key reasons: its catalytic impact and its flexibility in responding to changing market constraints.<sup>2</sup>

In this way, UNCDF ensures that solutions implemented are sustainable, because they are not dependent on the indefinite presence of UNCDF in the market but on existing market actors implementing viable business models.

**This also ensures that successful interventions can be identified early, based on:**

- the entrance of new actors into the market (seeing more business opportunities)
- increase in investment by existing actors.

## 1.1 MSD IN THE CONTEXT OF THE UNCDF STRATEGY

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UNCDF values and celebrates a corporate DNA that is characterized by quick responses to dynamic environments, coordinating and leveraging other bilateral and multilateral partners, while acting as an early-stage investor to de-risk investment in crucial areas of least developed countries' (LDCs') economies. As stated in the 2008 Assessment of Multilateral Organizations by the Government of Sweden, "UNCDF should be seen as a development actor that paves the way for others."<sup>3</sup> UNCDF is therefore undertaking a more targeted approach, focusing resources to trigger transformative change within key sectors of Uganda's economy, while fostering enabling conditions for generating productive employment.

UNCDF is using its existing experience and networks to identify key sectors, LDC priorities, and coordinate with local government and other donors to pool resources. This provides a strong rationale to follow an MSD approach to instigate structural transformation of the real economy.

## 1.2 CATALYTIC IMPACT

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Because an MSD approach focuses on addressing systemic constraints, adopting it in implementing this programme allows UNCDF and its partners to address bottlenecks and 'unlock' the market so that different stakeholders can continue to operate as they do within that market system.

## 1.3 FLEXIBILITY IN RESPONDING TO CHANGING MARKET CONSTRAINTS

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During its market systems assessment, UNCDF looked at the different market systems within the agriculture, health and education sectors, especially those in which members of vulnerable communities are actively participating in Uganda's Northern Region. These constraints were then prioritized on the basis of impact potential, digital relevance (feasibility of addressing the constraint using digital solutions) and resources required. However, the programme implementation team fully recognizes that markets are subject to constant social, political and economic changes. Constraints within markets can therefore change; an MSD approach allows flexibility in switching what constraints to focus on to unlock the market systems relevant to a given vulnerable community.

## 1.4 RECALIBRATING FOR THE COVID-19 PANDEMIC

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Barely a year into the project's implementation, like many countries around the world, Uganda was not spared the effects of the COVID-19 pandemic, ranging from supply chain disruptions to life-threatening health and livelihood disruption.

<sup>2</sup> The MSD approach is adapted from *Guidelines for Country Programme Market Selection, Diagnosis and Intervention Planning*, developed by The Springfield Centre for Business in Development together with the Business Innovation Facility (BIF2) team, for BIF, as an output from a project funded by the (then) Department for International Development (DFID) of the United Kingdom of Great Britain and Northern Ireland.

<sup>3</sup> United Nations Capital Development Fund, *Strategic Framework* (New York, 2013).

The health risk and livelihoods tension came to bear when social distancing and travel bans to curtail the spread of the virus directly impacted the ability of women and men to make a living.

*The Sustainable Development Goals (SDG) Report 2020*<sup>4</sup> emphasizes progress had remained uneven before the COVID-19 pandemic, and the world was not on track to meet the SDGs by 2030. COVID-19 has worsened the situation as tens of millions risk being pushed back into extreme poverty and hunger, erasing the modest progress made in recent years.

This follows “an unprecedented health, economic and social crisis that is threatening lives and livelihoods, making the achievement of Goals even more challenging. Health systems in many countries have been driven to the brink of collapse. The livelihood of half the global workforce has been severely affected. More than 1.6 billion students are out of school. Although the novel coronavirus affects every person and community, it does not do so equally.”<sup>5</sup>

The UNCDF strategy of ‘leaving no one behind in the digital era’ is designed to diversify opportunities for small and medium-sized enterprises (SMEs), individuals and governments to decelerate COVID-19 effects through digitalization of economic and service access processes.

However, despite this, the COVID-19 pandemic calls for accelerating implementation, addressing the gap in access to digital services, such as infrastructure, ecosystem, user skills/capacity aspects and use-case development.<sup>6</sup> There is also a call to conduct more research into why the digital divide is stereotyped as an urban-rural divide when the pandemic has highlighted that even within urban dwellings, vulnerabilities exist for both businesses and individuals.



<sup>4</sup> *The Sustainable Development Goals Report 2020* (United Nations publication, 2020). Available at <https://unstats.un.org/sdgs/report/2020/>

<sup>5</sup> *Ibid.*

<sup>6</sup> ‘Use case’ refers to how a person who uses a digital solution derives value from it or accomplishes their goal by using it; it refers to a specific situation in which a product or service could potentially be used.

# 2.

## MSD PRIORITIZATION FRAMEWORK



*To inform its strategy and interventions in agriculture, education, health and digital sectors, UNCDF undertook a thorough MSD study.*

The diagnostic process was broken down into three major phases:

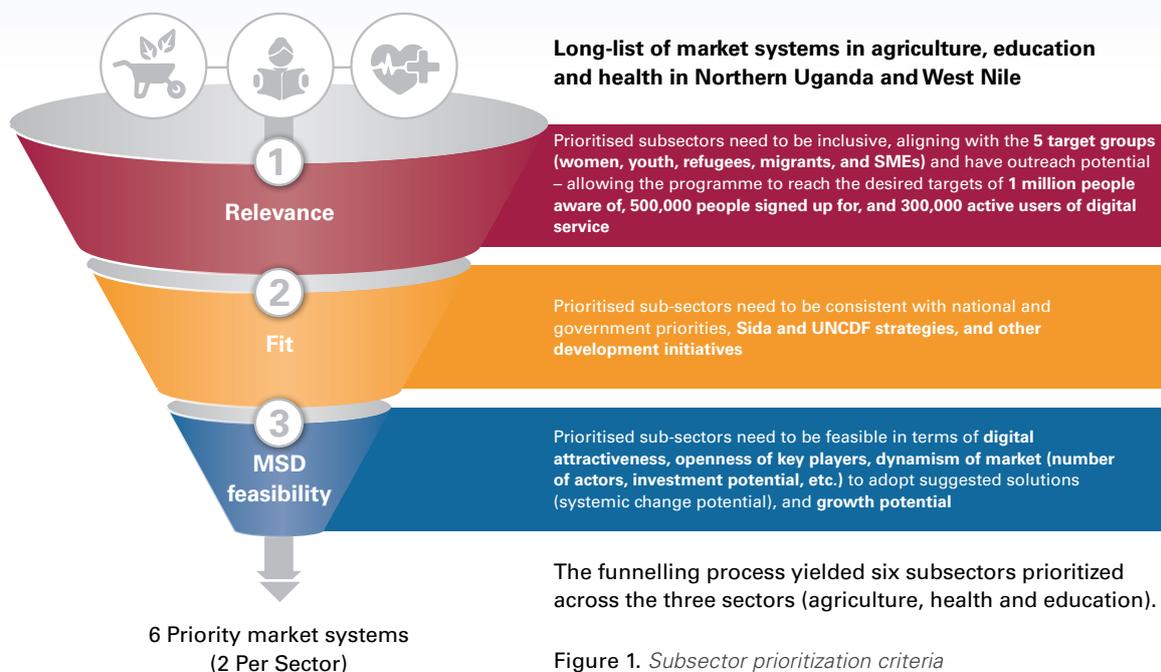


## 2.1 SUBSECTOR SELECTION

The subsector prioritization process aimed to move from a 'long-list' to a 'shortlist' of subsectors. It was neither efficient nor feasible for UNCDF to tackle the underlying constraints across the entire health, education and agriculture sectors in Uganda. Rather, a focused strategy around selected subsectors could improve programme delivery and effectiveness.

We used a funnelling approach to prioritize across three key areas. First, subsectors were assessed for relevance to the programme target segments and for

potential to reach large numbers of the target group. Emerging subsectors were then assessed for how best they fit within the priorities of the country, the donor and the programme. Lastly, the shortlisted subsectors were assessed for the feasibility for UNCDF to leverage digital solutions, to stimulate lasting, systemic change, and for what potential agents or triggers for change exist. Also taken into consideration at this point was the potential synergies with other interventions already happening in the subsector.



The funnelling process yielded six subsectors prioritized across the three sectors (agriculture, health and education).

**Figure 1. Subsector prioritization criteria**  
 Abbreviations: MSD, market systems development; SMEs, small and medium-sized enterprises.



Figure 2. Depiction of the funnelling process leading to the six priority subsectors  
Abbreviations: MSD, market systems development; TVET, technical and vocational education and training.

## 2.2 MARKET SYSTEMS ANALYSIS, DIAGNOSIS AND STRATEGY DEVELOPMENT

For each selected subsector, an in-depth analysis was done to identify and understand the root causes of the target group’s challenges and how UNCDF might help stimulate sustainable (i.e. systemic) changes that address these root causes using digital solutions.

This process involved three key steps.

- 1. Market mapping:** Mapping the structure, dynamics and key stakeholders in the primary market and associated interconnected markets within the identified subsectors.
- 2. Understanding systemic constraints:** Identifying constraints to the target group and exploring their root causes. We identified various constraints in the real economy and then looked at how feasible it is for digital solutions to significantly bring about systemic change.
- 3. Identifying innovation leverage point(s):** Pinpointing where UNCDF can be an effective catalyst (through firm-level and/or other interventions) for inclusive system change using broadly digital solutions.

## 2.3 MAPPING MARKET STRUCTURE AND PERFORMANCE

Mapping market structure and performance included describing the market and its dimensions, dynamics and stakeholders.

- The key activities and interactions, and any significant variations in the way in which these functions are undertaken – includes various operational models between stages and players.
- The key market players involved in providing each function (i.e. those who ‘do’ and those who ‘pay’). For instance, who is engaged in the distribution function? How are they paid? Who provides agro-extension information, is it an embedded service, free or paid for by farmers?
- Incentives and capacity of these players to perform or pay for these functions and how well they are performing them. For example, teachers are providing education service to students but may not have adequate skills or the incentive to improve their capacity.

- Any important aspect of their business models or tactics may determine the quality of their performance. For example, how volunteer (community) health workers make a livelihood out of their profession by leveraging their networks to sell other non-health related products or services.
- Any significant political economy factor affecting player incentives. For example, how provisioning of new services targeting refugees alone may exacerbate their relationship with host communities, thus risking the long-term sustainability of the initiative.

It also included assessing the interconnections in the markets.

- **Market structure:** How core products, service markets, supporting functions, and rules describing key activities, key market players and their capabilities, can influence the performance of business models, and evolution of political economic factors and regulations.

- **Market dynamics:** In terms of the key trends explaining how the market is and how it evolves. There may be overall national focus and focus at the subsector level. For example, we may look at the overall health sector before focusing on the identified subsector (e.g. primary health care in Northern Uganda).
- **Market performance:** How the key functions (important to the target group) are performed and where underperformance may persist. For example, in agriculture we may look into productivity and cultivation area for major crops.

Figure 3 depicts how we approached the market systems mapping with an example from the education sector.

The 'hexagonal tool' used (Figure 3) was developed by Dalberg Analytics; in the analysis of the key constraints it involved:

- identifying the core actor in the market system, identified as the one that had interactions with the largest number of other actors in the system

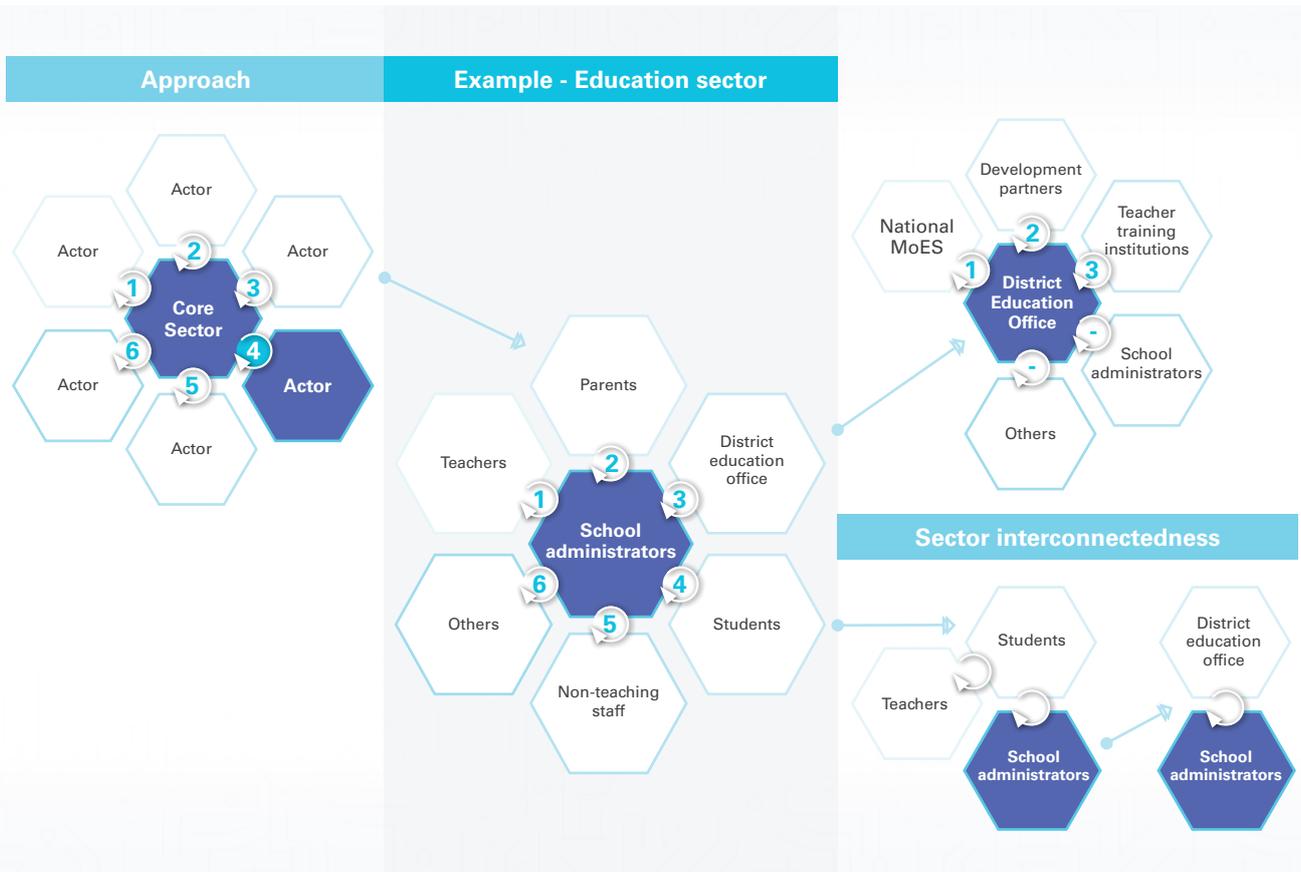


Figure 3. Market systems mapping approach – example of the education sector  
Abbreviations: MoES, Ministry of Education and Sports.

- (ii) focusing analysis on selected pairings of relationships between peripheral actors and the core actor, from which the most significant constraints were identified
- (iii) analysing these relationships in relation to the constraint, by identifying the underlying misalignment in incentives and capacities of the different actors, which cause the inefficiencies and negative outcomes in the market system.

Ultimately, the aim of the analysis was to be able to identify the main actors, interactions and incentives that were driving the persistence of prioritized constraints, which would help to inform decisions on where to target interventions.

Figure 3 depicts the various actors in the education sector with the core actor being the school administrators. It also depicts an example of the interconnectedness in the sector, showing how a single actor, the district education office, is connected to other actors, thereby providing insight into actors, their relationships and an understanding of the full market structure.

## 2.4 IDENTIFYING INNOVATION LEVERAGE POINTS

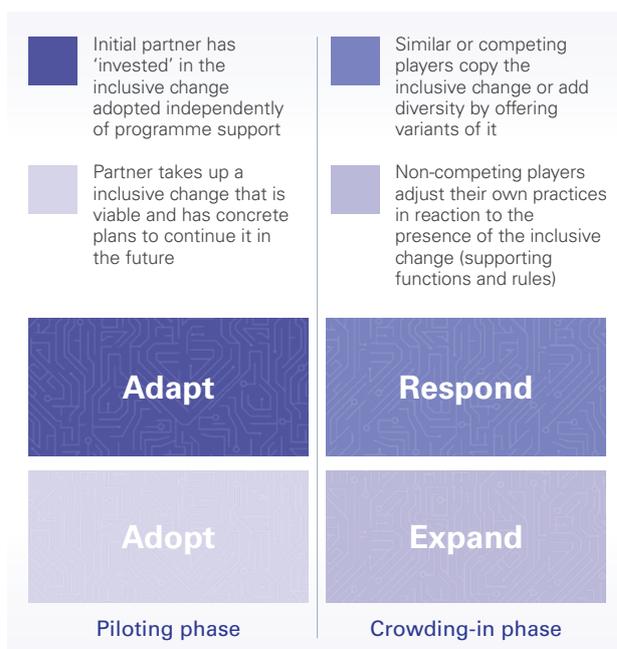
From the multiple constraints identified and the numerous opportunities to address them, an appraisal process was undertaken to assess the feasibility of UNCDF interventions and their effectiveness as catalysts for change.

Key considerations here included the following.

- **Innovation potential:** What is the potential for UNCDF tools (innovation, grants, technical assistance, etc.) to stimulate and contribute to sustainable inclusive change? Are there potential private sector innovation opportunities for UNCDF to support practical changes among other key market players?
- **Partnerships:** What is the scope for building effective partnerships with other incentivized firms (or system players) to leverage inclusive innovation and the long-term commitment to 'doing

things differently'. The choice of partners is also to be aligned to the long term aim of UNCDF of 'crowding-in'<sup>7</sup> and increasing competition.

- **Systemic potential:** Does the intervention and associated innovation represent a genuinely systemic opportunity – something that can potentially deliver or lead to wider systemic change, or is the prospect likely to be limited to firm-level impact?
- What potential intervention(s) does UNCDF need to encompass in its intervention strategy that will ensure the transition from firm-level impact to wider crowding-in and system-wide change? This requires assessment, discussion and planning around what steps UNCDF should incorporate in its subsector strategy that explicitly seek to stimulate systemic change – for example, model/practice adoption, adaptation, expansion and market response.



The methodology and processes detailed above were used to narrow down the options for UNCDF intervention in the four programme target sectors: digital, agriculture, health and education.

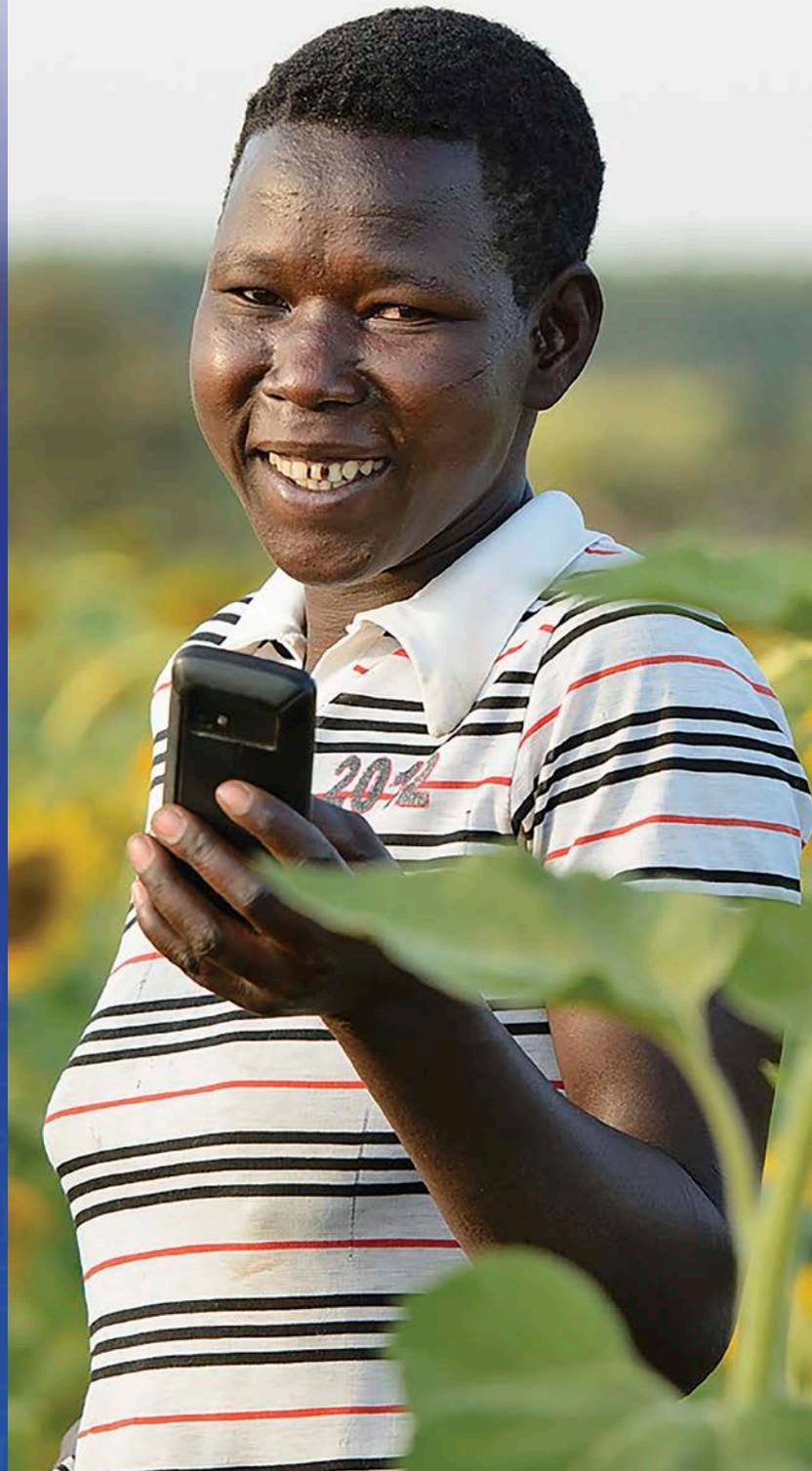
Figure 4. Framework for systemic change and innovation uptake (AAER)<sup>8</sup>

<sup>7</sup> 'Crowding-in': using the market systems development approach, UNCDF aims to attract other private sector players to invest in areas they previously ignored or thought were not economically viable.

<sup>8</sup> 'AER framework: Adopt meaning partners buy into the UNCDF vision of digital interventions to leave no one behind; Adapt means they pilot the intervention to prove that it works and makes a business case financially and socially; Expand means they implement the same projects in other regions, but also add some new products to the solution; and Respond is how the market reacts to the intervention.

# 3.

## ADDRESSING SOCIO-ECONOMIC CHALLENGES WITH THE MSD APPROACH



*This section provides sector-specific findings from the inception study, in conjunction with secondary research. Each section includes the sector background and dynamics followed by a constraint analysis and the vision and strategy for the sector.*

### 3.1 AGRICULTURE

Uganda is highly dependent on agriculture for economic output and employment. The sector constitutes 24.5 percent of gross domestic product (GDP) (services at 52 percent, industry at 23 percent), accounts for 71.9 per cent of employment (services at 4.4 percent, industry at 23.7 percent) and contributes 78 percent of export earnings. Notably, the agricultural sector growth rates have averaged 3.4 percent per annum for the last five years (2015–2019) – lower than the other sectors.

There are about 3 million farming households in Uganda. Most of these are smallholders, women and youth operating at subsistence level on small farms averaging an area of about 1.1 ha (2.7 acres). Some 77 percent of farmers are women and 63 percent are youth – together they account for 75 percent to 80 percent of the total agricultural output and marketed agricultural produce in the country.

Some 81.6 percent of Ugandans live in rural communities, and the majority of the Ugandans who are classified as poor and vulnerable are involved in agriculture; 34.6 percent of the population lives below poverty line (US\$1.9 a day). Agricultural labour productivity is estimated to be 13 percent of workers in other sectors. Table 1 shows the contribution of agriculture to Uganda’s GDP according to the National Development Plan (NDP) III.

**Table 1.** Contribution to growth by sector, Uganda, National Development Plan. **Source:** (NDP) III

	<i>Actual</i>		<i>Estimated</i>				
	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Real GDP <sup>a</sup>	6.51	6.3	6.2	6	6.5	6.88	7
Agriculture, forestry and fishing	1.72	1.65	1.61	1.55	1.66	1.75	1.78
Industry	1.83	1.79	1.8	1.76	1.94	2.08	2.15
Services	2.95	2.86	2.8	2.69	2.9	3.04	3.08

### SECTOR DYNAMICS

The agriculture sector dynamics rely solely on a value chain approach that is divided into two: structured and loose value chain.

A structured value chain in agriculture comprises defined value chain actors that have a mandate to promote a particular enterprise collectively. Aspects such as access to markets, inputs and advocacy are collectively done throughout the entire structured value chain. A loose

value chain has several actors each struggling to make their own ends meet, often colliding in the market. However, the rejuvenation and strengthening of value chain actors such as producer organizations, cooperatives and farmers groups is being scaled up across Uganda as an avenue to streamline farming activity in the hard-to-reach areas.

**Note:**<sup>a</sup> Real GDP = measure of a country’s gross domestic product that has been adjusted for inflation. <sup>\*</sup>Results based on the structure of the 2016/17 Social Accounting Matrix (SAM)

## A typical loose agricultural value chain

Figure 5 shows a flow chart of a typical agriculture value chain focusing on an agriculture-dependent household. Health and education are the major out-of-pocket outflows for a rural agriculture-dependent household. Various intermediaries such as traders, input sellers and processors are involved, while association and microfinance institutions (MFIs) provide support functions. For some higher-valued crops, there are also exporters.

A lot of the project implementation will target these structured value chains, most of which are found in the traditional cash crops such as coffee, tea, sunflower, cotton, sugarcane, tea and tobacco. Figure 6 shows an example of a tight value chain (coffee).

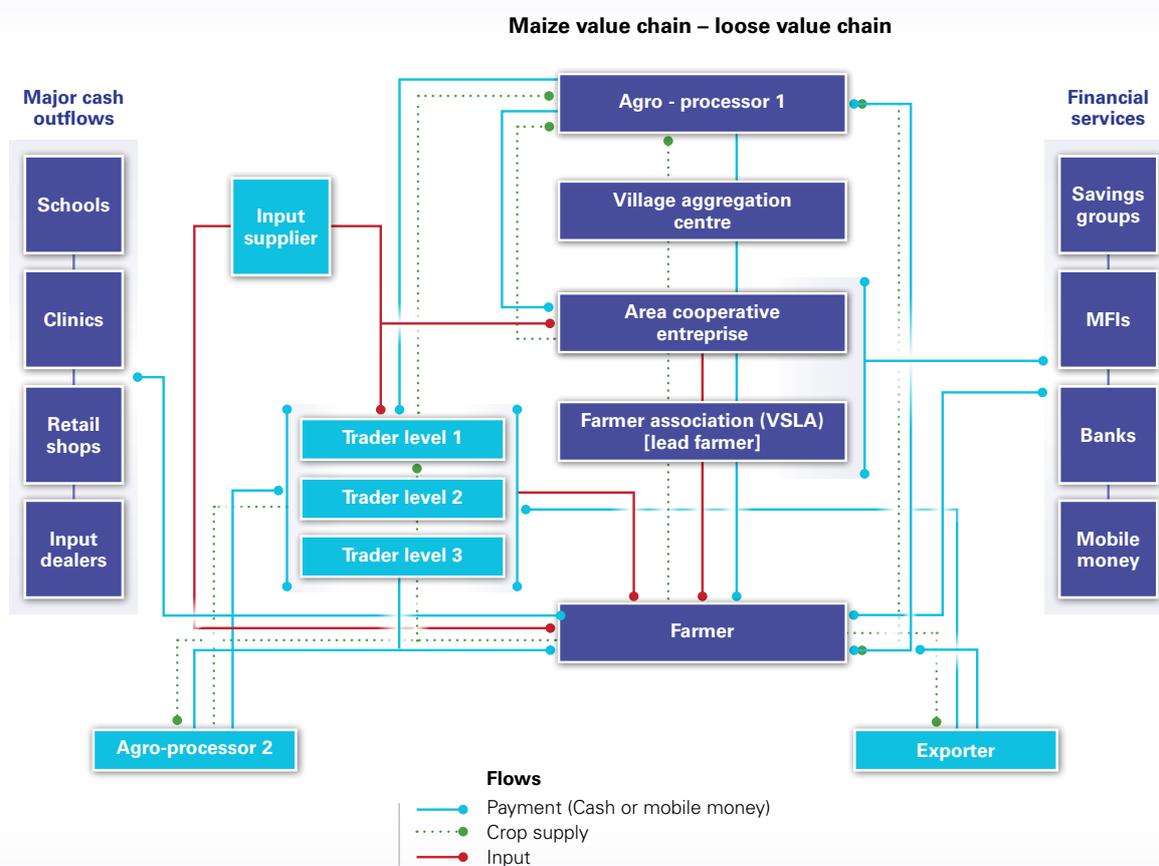


Figure 5. Flow chart of a typical agriculture value chain: maize

Abbreviations: MFIs, microfinance institutions; VSLA, village savings and loans associations.

Coffee value chain - structured value chain

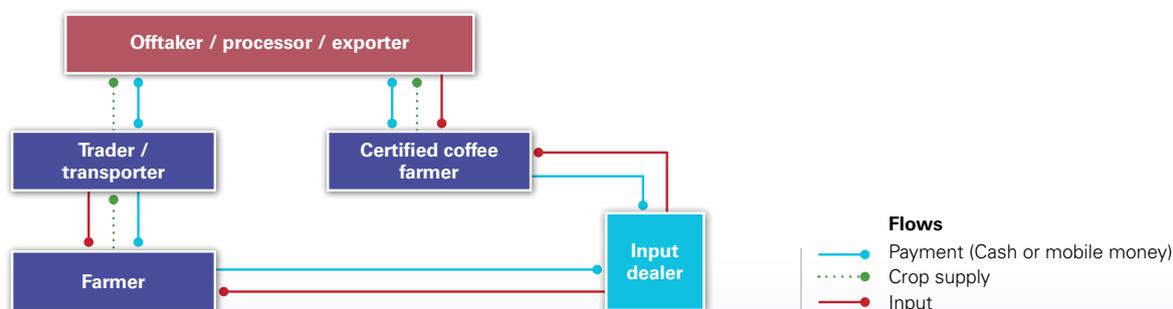


Figure 6. Example of a structured value chain: coffee

## MAJOR DEVELOPMENT PARTNERS IN THE SECTOR

Table 2 provides a summary list of key actors operating or involved in the agriculture sector of Uganda.

	Main sponsor(s)	Type	Description
Agriculture Cluster Development Project	 	<ul style="list-style-type: none"> <li>Improve productivity and food security in Uganda</li> </ul>	<ul style="list-style-type: none"> <li>Raise on-farm productivity, production and marketable volumes of selected agricultural commodities in specified geographic clusters</li> </ul>
Promotion of Rice Development (PRiDe) Project	 	<ul style="list-style-type: none"> <li>Value chain development</li> </ul>	<ul style="list-style-type: none"> <li>Increasing rice production by 20,000 tons through building capacity for rice-related researchers, institutions, extension service providers and farmers</li> </ul>
Feed the Future Uganda Agricultural Inputs Activity		<ul style="list-style-type: none"> <li>Agro-dealer programme</li> </ul>	<ul style="list-style-type: none"> <li>Promote use of high-quality agricultural inputs and decrease the prevalence of counterfeit agricultural inputs</li> </ul>
Project for Restoration of Livelihoods in the Northern Region (PRELNOR)		<ul style="list-style-type: none"> <li>Financing and development of market infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Increasing sustainable production, productivity and climate resilience of smallholder farmers and provide increased and profitable access to domestic and export markets</li> </ul>
Africa 2000 Network (A2N)		<ul style="list-style-type: none"> <li>Provide extension services</li> </ul>	<ul style="list-style-type: none"> <li>Improving smallholder productivity and controlling striga in Eastern Uganda through scaling up integrated soil fertility management (ISFM) interventions</li> </ul>
National Animal Disease Diagnostics and Epidemiology Center (NADDEC)		<ul style="list-style-type: none"> <li>Enhance technical support and capacity-building</li> </ul>	<ul style="list-style-type: none"> <li>EMPRES-i Event Mobile Application (EMA) allows national veterinary authorities to use smartphones to report disease outbreaks</li> </ul>

Table 2. Development partners in the agriculture sector

## AGRICULTURE CONSTRAINTS ANALYSIS

In sub-Saharan Africa, there is fairly broad agreement that increased investment in key public goods – such as roads, communications infrastructure, agricultural research and water control – will be required if significant and sustainable agricultural development is to take place. While Uganda has rightly put emphasis on the agricultural sector as a strategy for raising rural incomes and reducing rural poverty, it has proved more difficult to reach agreement on what needs to be done to improve the performance of the agricultural market. The 'Plan for Modernization of Agriculture' (PMA) was designed in 2000 for this purpose. However, available secondary data show that crop yields are still low despite the availability of productivity-enhancing technologies on the market.

There are numerous challenges in the agriculture sector in Uganda's Northern Region which hinder the ability of the sector to effectively and efficiently drive economic growth.

### **These challenges inhibit farmers ability to maximize their profits in two ways:**

- (i) farm-gate prices are not maximized
- (ii) the volumes produced and sold are not optimized for land and market conditions.

### **The main underlying constraints for each of these challenges include:**

- asymmetries in market price information between different actors in the sector, which hinder farmers' ability to make strategic decisions that affect the price at which their products are sold
- suboptimal yields, high postharvest losses and limited access to buyers – which limit farmers' ability to maximize volumes produced and sold.

These constraints have a significant impact on the income-generation potential of the core actors in the sector, namely farmers and retailers. They also present significant opportunities to leverage digital solutions that can have widescale impact in unlocking the full growth potential of the sector, which is in line with UNCDF objectives.

Therefore, a deeper analysis of these challenges is warranted, to understand the dynamics of relationships among actors that drive the persistence of these issues, and what incentives need to be aligned to ensure success in the sector.

### **Of particular concern is:**

- the relationships between farmers and extension workers – the few extension workers are unable to reach all farmers – and the lack of an easily accessible platform through which farmers can request extension services
- the limited capacity of some extension workers themselves, due to poor (or lack of) continuous training.

To address these key constraints in the agriculture sector, it will be important to find mechanisms to empower farmers. Most of the challenges they face while trying to optimize prices of agricultural produce are due to asymmetries in market price information between different actors in the ecosystem.

### **To address these challenges, it will be key to provide:**

- an independent source of market information that farmers can rely on to make production and supply decisions
- business development support to farmers to empower them in doing analysis and making decisions regarding their business.

The bulk of the challenges in the optimization of volumes produced and sold are due to suboptimal yield, postharvest losses and limited access to buyers.

**It will be vital to provide the best agronomic practices ranging from inputs to postharvest treatment of agricultural produce to ensure optimization of volumes of crops produced and sold.**

## SECTOR VISION AND STRATEGY (SOLUTIONS)



### Agriculture vision of change

- **Client level (client outcomes):**

- Improved access to agro-advisory and e-extension services, quality input provision and financial services

- **Sector level:**

- Improved operational efficiency of existing producer organizations and cooperatives
- Improved value chain linkages

- Improved performance of micro, small and medium-sized enterprises (MSMEs) in agriculture value chains
- Improved agriculture value chain management that traces all farming activities, which will improve access to information, markets and farmer loyalty.

- **Goals (private and public sectors):**

- Increased income in rural communities
- Increased productivity and access to credit.

Figure 7 shows how the agriculture vision of change will be achieved, using the Adopt, Adapt, Expand and Respond (AAER) framework.

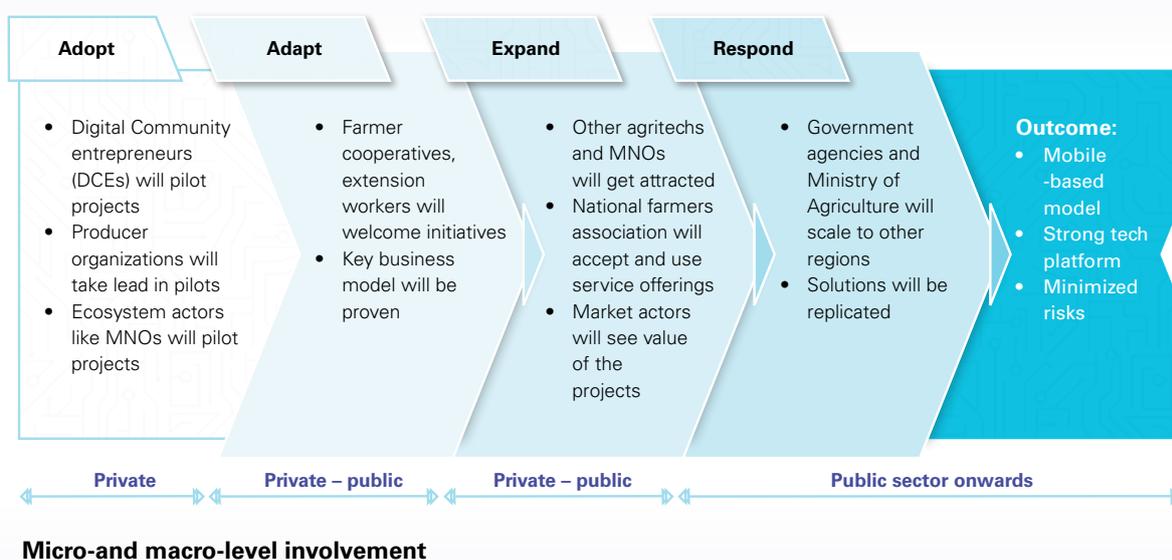


Figure 7. How the vision of change will be achieved  
Abbreviations: MNOs, mobile network operators.

## Agriculture System Strategy

Table 3. Private sector market dynamics in Northern Uganda

System Parameter	Baseline Status	UNCDF Strategy	Desired System State
<ul style="list-style-type: none"> <li>Agricultural extension workers service delivery</li> </ul>	<ul style="list-style-type: none"> <li>1 extension worker serving 2,000 farmers in deep rural areas</li> </ul>	<ul style="list-style-type: none"> <li>Improve extension and agro-advisory (digital extension and agro-advisory solution: use digital agents as level 1 extension workers)</li> <li>Leverage farmers' call centre to extend extension services</li> </ul>	<ul style="list-style-type: none"> <li>Additional level 1 and level 2 digital extension agents serving up to 500 farmers each</li> </ul>
<ul style="list-style-type: none"> <li>Farmers have better productivity and access to quality inputs</li> </ul>	<ul style="list-style-type: none"> <li>Low farm yields and counterfeit inputs</li> </ul>	<ul style="list-style-type: none"> <li>Pilot and scale traceability and records management</li> <li>Forward traceability to track supply of inputs to the farms</li> </ul>	<ul style="list-style-type: none"> <li>50% of surveyed customers have high satisfaction</li> </ul>
<ul style="list-style-type: none"> <li>Farmers have improved access to information and markets</li> </ul>	<ul style="list-style-type: none"> <li>Poor farming practices</li> </ul>	<ul style="list-style-type: none"> <li>Digital marketplace to manage flow of information to farmers</li> </ul>	<ul style="list-style-type: none"> <li>60% of all profiled farmers have access</li> </ul>
<ul style="list-style-type: none"> <li>Farmers have increased access to savings and credit service offerings</li> </ul>	<ul style="list-style-type: none"> <li>Farmers lack formal collateral as basis to access credit</li> </ul>	<ul style="list-style-type: none"> <li>Dedicated savings and credit solutions leveraging alternative data sets as collateral to improve access to loans</li> </ul>	<ul style="list-style-type: none"> <li>30% of total profiled farmers have access</li> </ul>



## 3.2 HEALTH

A Ugandan's health and life expectancy is among the lowest in the world. In **Uganda**, one in every 200 births ends the mother's life, around one million people are living with HIV. Additionally, although malaria accounts for 14 percent of all deaths, less than 10 percent of children under five are sleeping under insecticide-treated nets. The probability of a child dying before reaching age five was 5.5 percent (55 deaths for every 1,000 live births), and total health expenditure as a percentage of GDP was 6.53 percent in 2018.

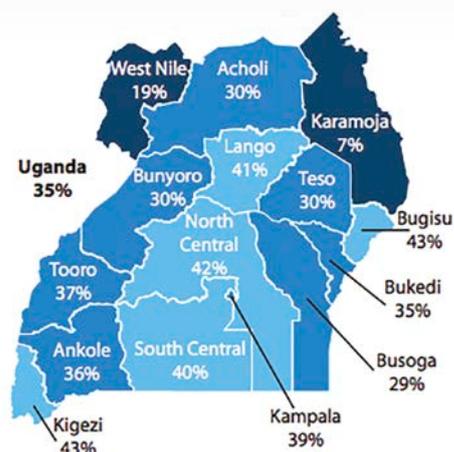
According to the World Health Organization (WHO), Uganda's burden of disease is dominated by communicable diseases, which account for over 50 percent of morbidity and mortality. Malaria, HIV/AIDS, tuberculosis (TB), and respiratory, diarrhoea, epidemic-prone and vaccine-preventable diseases are the leading causes of illness and death.

The Northern Region and West Nile subregion are the poorest in Uganda. Making the cost of health care a burden to local communities (see Figures 8 and 9). For example, the use of modern methods of family planning among married women varies by residence and region. Modern method use is higher in urban areas (41 percent) than in rural areas (33 percent). Modern method use ranges from a low of 7 percent in Karamoja subregion to a high of 43 percent in Kigezi and Bugisu subregions. Women with more than secondary education are nearly twice as likely to use modern methods than women with no education (43 percent versus 23 percent). Modern family planning use increases with wealth: 22 percent of women from the poorest households use a modern method of family planning, compared with 42 percent of women from the wealthiest households. Figures 8 and 9 highlight disparities between subregions. The Northern Region and West Nile subregion have low use of modern family planning. The same disparity is visible with other services. Hence, there are high numbers of child and maternal mortalities in these areas.

**Figure 8:** Use of modern family planning methods and prevalence of malaria in infants in Uganda by subregion

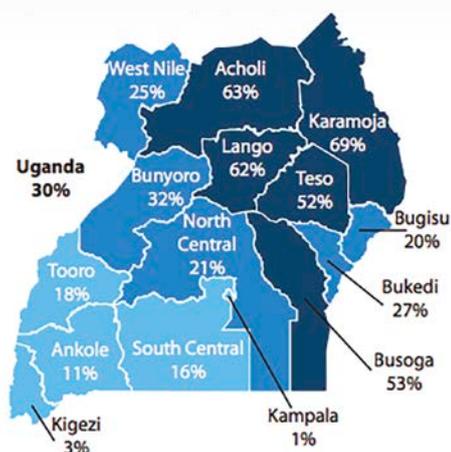
Source: 2016 Uganda Demographic and Health Survey.

Modern Method Use by Region



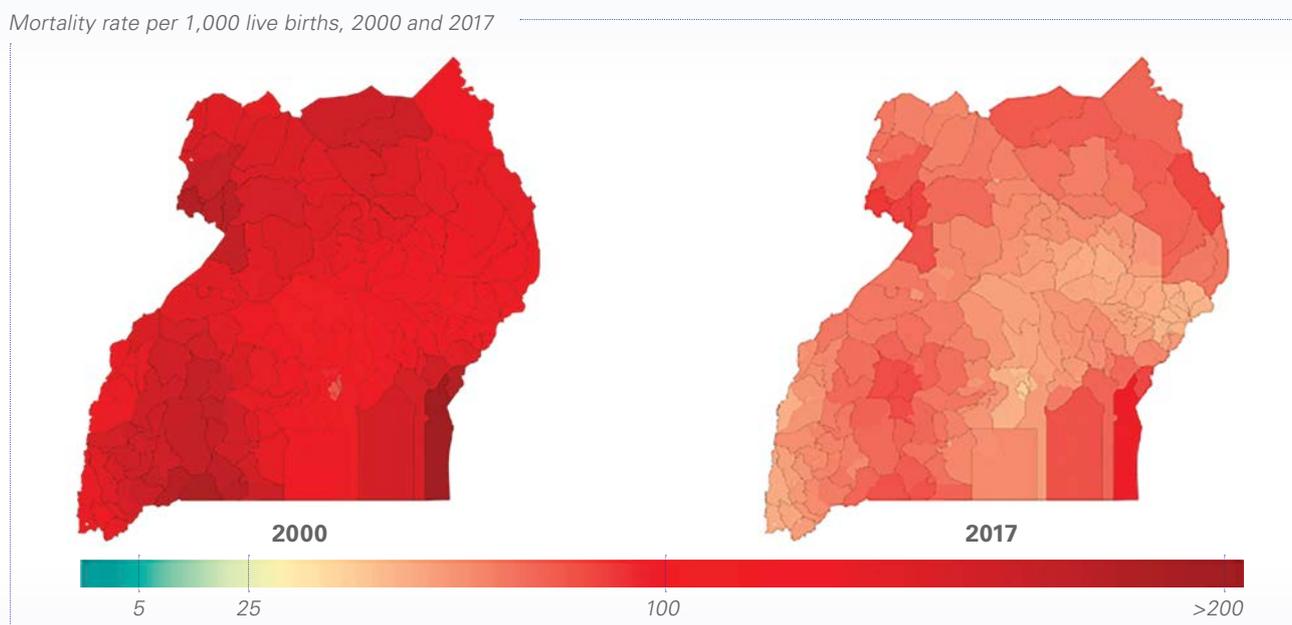
Percentage of married women age 15–49 using a modern method of family planning

Malaria Prevalence by Region



Percentage of children age 6–59 months who tested positive for Malaria by Rapid Diagnostic Test (RDT)

**Figure 9:** Child mortality in Uganda by region. **Source:** 2016 Uganda Demographic and Health Survey.



Key constraints in the health care sector include poor management of drugs. Stock-outs of essential medicines at the health-facility level are an important and widely acknowledged public health problem in sub-Saharan Africa with a recognized negative impact on morbidity, mortality and disease epidemiology. Many possible causes have been cited, including procurement financing and processes, supply capacity, communication and road infrastructure, distribution of resources, planning methods, personnel staffing and training, and coordination among stakeholders.

Community health workers are increasingly recognized as an integral component of the health workforce needed to achieve public health goals in low- and middle-income countries (LMICs). However, the community health workers are volunteers and most lack motivation to carry out their duties.

International development agencies and international non-governmental organizations (NGOs) are complementing government efforts to drive the growth of digital innovations in the health sector. Consequently, digital solutions are playing a crucial role in serving rural basic health care to communities.

#### Digital health has several benefits, including:

- improving access to health care services especially for those in hard-to-reach areas
- safety and quality of health care services and products
- improving knowledge and access of health workers and communities to health information
- cost savings and efficiencies in delivery of health services
- improving access to the social, economic and environmental determinants of health

All of which could contribute to the attainment of universal health coverage.

However, digital health deployment is constrained by challenges such as poor coordination of mushrooming pilot projects, fractured and weak health systems, lack of awareness and knowledge about digital health, poor infrastructure (e.g. unstable power supply, poor connectivity), and lack of interoperability of the numerous digital health systems. A market systems approach to digital health will allow UNCDF to work in collaboration with key stakeholders to address some of these constraints. Partnerships with market actors will be developed to bridge the gap and address constraints for all the different market systems (community and health facility). UNCDF will identify a digital community model that works in Uganda to

replicate and pilot in Northern Uganda, focusing on building digital solutions to solve the market constraints in the health sector. Additionally, a digital stock management solution will address the constraints seen at health facilities.

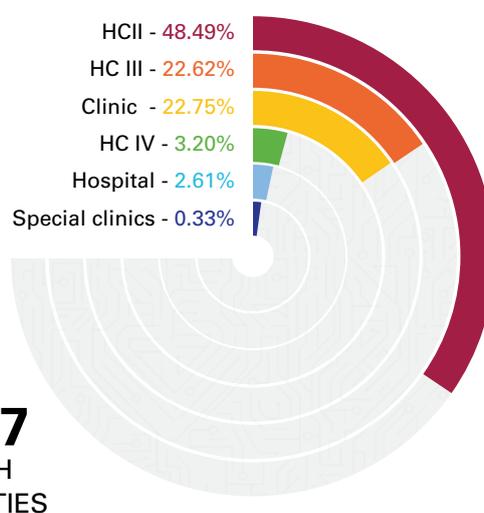
## SECTOR PROFILE

The sector focuses on increasing access to quality health services. Uganda's disease burden is heavily skewed

toward communicable diseases (malaria, HIV and TB make up over a third of the country's disease burden). While low-income households receive most of their care in facilities that are government-run (public) or subsidized/private-not-for-profit, health care spending still imposes substantially higher shocks on them than on other households because the percentage of their income diverted to health care costs is greater. Tables 4 and 5 show the number of health facilities in the regions where UNCDF is working in comparison with health facilities across the country.

**Table 4.** Health facilities in Uganda

Summary of health facility levels		
Level	Count	Percentage
Clinic	1578	22.75%
HC II	3364	48.49%
HC III	1569	22.62%
HC IV	222	3.20%
Hospital	163	2.35%
RH	3	0.04%
NRH	2	0.03%
RRH	13	0.19%
SC	23	0.33%



**Table 5.** Distribution of health facilities in Northern Uganda and Kiryandongo District | Source: Ministry of Health

Location	Health centre II	Health centre III	Health centre IV	Hospital	Regional referral hospitals	Special clinics
West Nile subregion	158	129	11	12	1	1
Acholi subregion	169	64	7	6	1	1
Lango subregion	123	75	10	6	1	1
Kiryandongo District <sup>a</sup>	15	8	0	2	0	0
<b>Total</b>	<b>465</b>	<b>276</b>	<b>28</b>	<b>26</b>	<b>3</b>	<b>3</b>

## Challenges

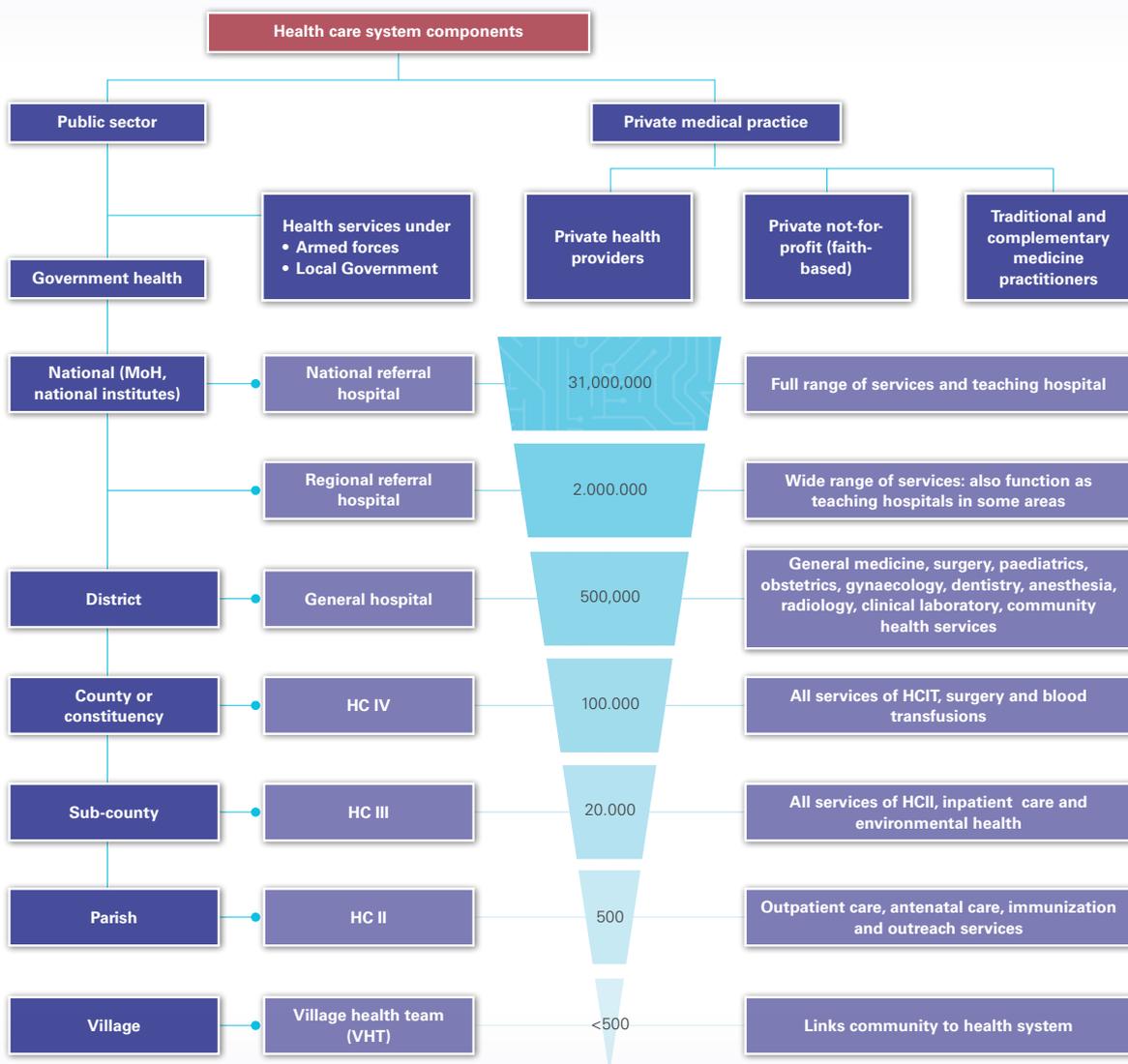
- High newborn and maternal mortality rates
- Current staffing norms out of sync with the services provided and workload
- Poor remuneration causing failure to attract highly skilled personnel to remote areas
- Stocks-outs of key commodities at facility level
- Inadequacy in the maintenance of medical equipment nationwide.

**Note:**<sup>a</sup> In Kiryandongo, Western Region, a total of 25 health facilities serves a population of 272,849.

## Sector dynamics – structure of the health sector

The Ugandan health care sector is diverse, with many actors, and different levels of services in urban and rural areas. Though there are no user fees for public health care, out-of-pocket payments account for approximately 50 percent of total health expenditure, indicating that the private sector is well developed. The public health care budget is relatively low, and the government encourages shared financing, such as private hospital wings and public-private partnerships (PPPs).

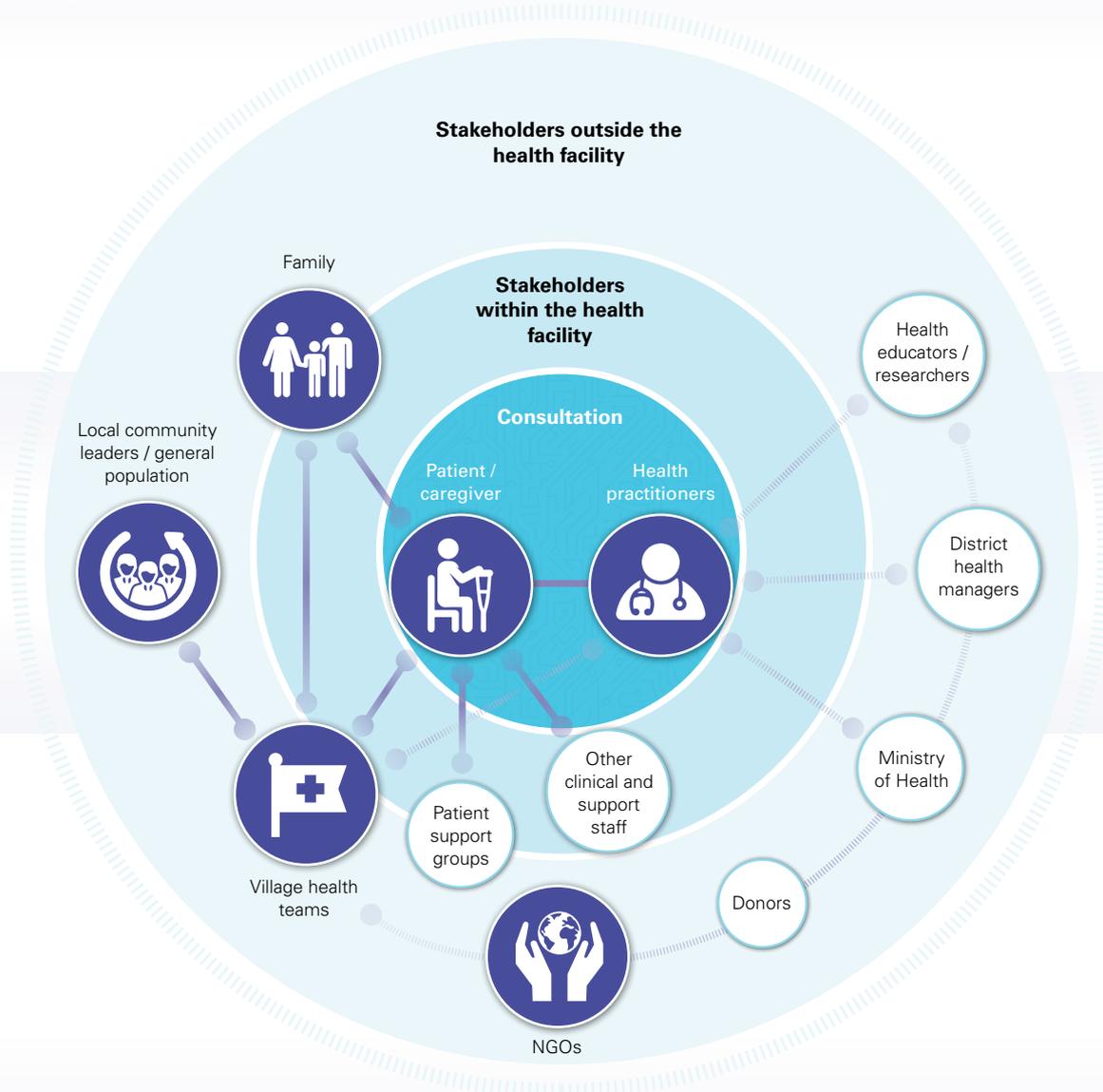
Private not-for-profit organizations are important service providers, especially in rural areas. Focus has been on communicable diseases; however, non-communicable diseases are on the rise, resulting in increased challenges for the health care sector. The health care sector is thus undergoing important changes, giving rise to potential business opportunities in various areas.



**Figure 10.** Key actors in the health sector in Uganda  
Abbreviations: HC, Health centre; MoH, Ministry of Health.

Source: Acup, C., et al., Factors influencing passive surveillance for T. b. rhodesiense human african trypanosomiasis in Uganda. Acta Trop. (2016)

## The ecosystem



**Figure 11.** *The Uganda health-sector ecosystem*  
Abbreviations: NGOs, non-governmental organizations.

In Northern Uganda, health care provision is supported by a range of local and international organizations, including for-profit and not-for-profit organizations within the private sector, development partner institutions and social enterprises. Key players address health sector challenges to various degrees and may focus on specific diseases or components of the value chain for health services.

## Constraint analysis

Using the Dalberg hexagonal tool, the following key actors were identified (Figure 12).



Figure 12. Health-sector actors in Northern Uganda

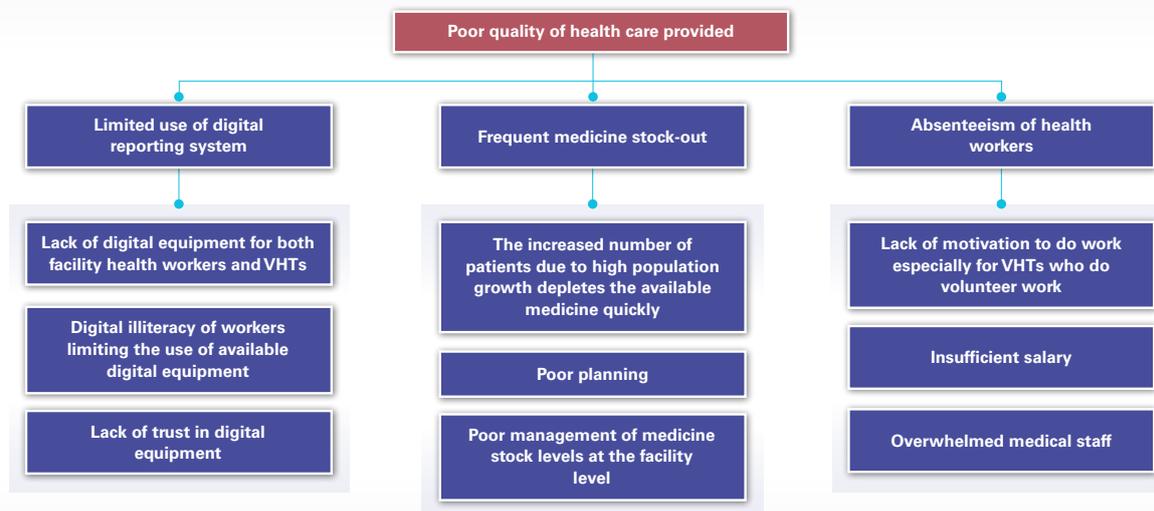
It was observed that village health teams (VHTs) and health facilities are core health care providers for rural patients.

Hence, improving health outcomes requires improving their performance. Based on the constraint analysis, Table 6 was developed, particularly focusing on health facilities and VHTs.

Table 6. Constraints in the health sector in Northern Uganda  
Abbreviations: VHTs, village health teams.

Problem (Symptom)	Underlying Constraints	Underlying Constraints
Poor quality of health care provided	<ul style="list-style-type: none"> <li>Difficulty in graduating levels for health centres</li> </ul>	
	<ul style="list-style-type: none"> <li>Poor manual data collection and management</li> <li>Absenteeism of health workers</li> </ul>	<ul style="list-style-type: none"> <li>Low staffing levels due to high turnover of medical staff, staffing levels that do not increase with demand and high rejection rates of staffing offers</li> </ul>
	<ul style="list-style-type: none"> <li>Poor support for VHTs</li> </ul>	<ul style="list-style-type: none"> <li>Low staffing levels with limited training and communication</li> </ul>
	<ul style="list-style-type: none"> <li>Dysfunctional referral system</li> </ul>	<ul style="list-style-type: none"> <li>Poor communication system</li> <li>Limited number of ambulances</li> <li>Lack of fuel to use the available ambulances</li> </ul>
	<ul style="list-style-type: none"> <li>Insufficient supply of equipment</li> </ul>	<ul style="list-style-type: none"> <li>Lack of demand mapping at the facility level to inform the right level of equipment supply</li> </ul>

A constraint tree (Figure 13) was elaborated from the findings of the inception study.



**Figure 13.** Constraint tree based on the health care findings of the inception study  
Abbreviations: VHTs, village health teams.

## System strategy

The Ministry of Health implements a number of policies and strategies to improve the lives of Ugandans. The ministry believes in and supports the use of digital solutions in the different interventions that enable the sector to address some of its challenges. However, this is only possible through coordination, partnerships between stakeholders, alignment with the country-

specific priorities and needs, and collaboration to avoid duplication of efforts among stakeholders. In health, UNCDF identified two areas of focus where digital tools could alleviate or address some of the constraints at the community level as well as the lower health facilities level (Table 7).

**Table 7.** Focus areas to alleviate constraints in primary health care market in Northern Uganda

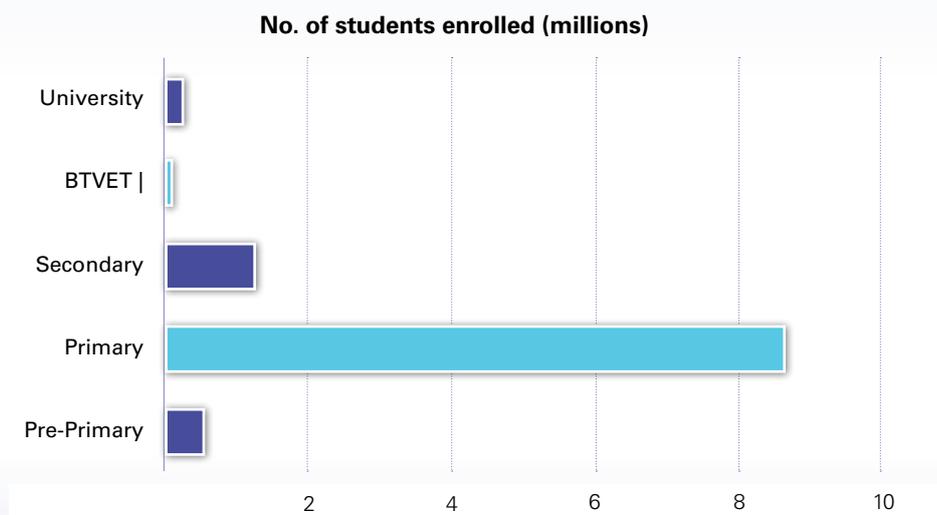
System parameters	UNCDF strategy	Desired system state
Lack of motivation to do work, especially for village health teams (VHTs) which do volunteer work	Digitalization of VHT model for the government to improve quality of service, performance and motivation (working with BRAC Uganda and Medic Mobile)	Improved community health workers (VHTs) quality of service, performance and motivation
Poor management of medicine stock levels at the facility level; poor planning; frequent medicine stock-out	Digitalization of stock management to improve supply management of essential drugs and medical supplies (working with Medical Access Uganda Limited and Signalytic)	Improved stock planning and management at health facility level

### 3.3 EDUCATION

Education is a crucial and persistent development challenge. The rapid development of digital technologies has been both an opportunity and a challenge for developing countries. Significant challenges, including the poor condition of Uganda’s educational system, continue to frustrate these lofty aspirations. Aware of the system’s many problems, the Ugandan Government, with assistance from the international community, has taken notable steps to reform and improve it.

The Ministry of Education and Sports (MoES) implements an education management information system (EMIS) – an information and communications technology (ICT) management tool that “integrates people, technology and practices in the process of collecting, capturing and processing data from different sources to generate information to aid informed decision making for operation and managerial functions of the education and sports sector.”<sup>9</sup> The tool is the foundation for the digitalization of the key pillars of the education sector in Uganda that will enable the sector to address some of the market constraints.

**School drop-out rate:** The education sector in Uganda faces a challenge of high school drop-out with only 16 percent to 18 percent of children enrolled in primary school ending up in secondary (Figure 14).<sup>10</sup>



**Figure 14.** School enrolment rates by level  
Abbreviations: BTVET, business, technical, vocational education and training.

**Literacy and regional gaps:** The national literacy rate at 72.2 percent is not only low but disproportionately lower among females whose literacy rate is 10 percentage points lower than that of males.

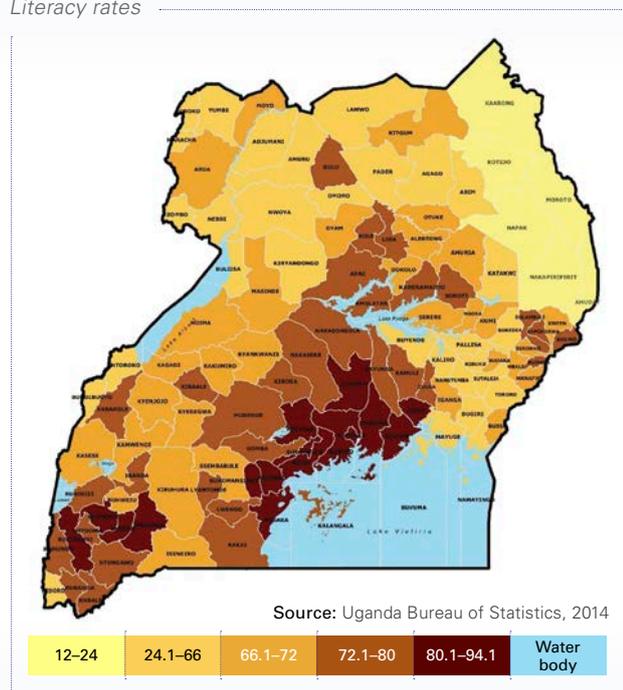
Figure 15 shows it is even worse in Northern Uganda. School classroom learning experience is challenged by high pupil–teacher ratio of 43:1<sup>11</sup> exacerbated by teacher absenteeism of approximately a third of the time.

<sup>9</sup> Uganda, Ministry of Education and Sports, ‘Education management information systems (EMIS)’ (Kampala, 2019). [www.education.go.ug/emis/](http://www.education.go.ug/emis/)

<sup>10</sup> Uganda, Ministry of Education and Sports, ‘Ministry of Education – Education abstract 2017’ (Kampala, April 2017). [www.education.go.ug/wp-content/uploads/2019/08/Abstract-2017.pdf](http://www.education.go.ug/wp-content/uploads/2019/08/Abstract-2017.pdf)

<sup>11</sup> UNESCO Institute for Statistics, ‘Uganda – Pupil teacher ratio’, Index Mundi. [www.indexmundi.com/facts/uganda/pupil-teacher-ratio](http://www.indexmundi.com/facts/uganda/pupil-teacher-ratio) accessed on 02 February 2021

Literacy rates



	Male	Female	Total
<b>Residence</b>			
Urban	91.5	84.4	87.8
Rural	75.2	58.9	66.8
<b>Region</b>			
Central	84.5	79.3	81.8
Central excluding Kampala	81.9	76.0	78.9
Eastern	71.9	55.0	63.1
Northern	74.3	46.7	60.0
Western	77.3	63.2	69.9
<b>Uganda</b>	<b>77.4</b>	<b>62.4</b>	<b>69.6</b>

Figure 15. Literacy rates by region

**Gender exclusion:** Education is not only disproportionately skewed by gender, but geographical access gaps can also be seen. Northern Uganda registers the greatest gap in education metrics, with West Nile, Acholi and Lango subregions having some of the lowest enrolment levels. On average, 31 percent of the population living in these three subregions live over 3 kilometres from the nearest primary school; Acholi subregion has the second highest population (38 percent) living 3 kilometres or more from a primary school.

Key sector constraints include financial costs impacting continuity of learning, perhaps also fuelled by social biases for boys' education over girls, some of whom are married young. Other constraints include teacher capacity, with 33 percent of the teachers having not attained minimum Grade III professional qualification (supply shortage). Even fewer (10 percent) have the Grade V certificate required for secondary schools. Amidst the capacity gaps, higher teacher education standards are coming into effect whereby all teachers shall be required to have a Bachelor of Education but specializing in pre-primary, primary, lower secondary or higher secondary education and tertiary education.<sup>12</sup>

These new government policy plans are to be phased in over a 10-year period, as Grade III and Grade V currently required for primary and secondary teachers are phased out.

Teachers make up approximately 68 percent of the public service of Uganda. The education service commission handles most of its activities of recruiting, confirming, promoting and disciplining of personnel manually. These activities are labour-intensive and paper-based. A lot of data is scattered in several manual files, leading to delays in information processing and dissemination to the relevant individuals who need the information. Analysing data is therefore difficult. Sometimes, data and information are misplaced or lost. The situation is made worse by the huge volumes of applications received and lack of sufficient storage space within the commission.

<sup>12</sup> The Independent, 'Government moves to phase out grade III & V teaching qualifications', 3 October 2019. [www.independent.co.ug/government-moves-to-phase-out-grade-iii-v-teaching-qualifications/](http://www.independent.co.ug/government-moves-to-phase-out-grade-iii-v-teaching-qualifications/)

## CONSTRAINT TREE – SECONDARY SCHOOLS

The study used the hexagonal tool to assess interaction between various market actors and identify key constraints in the sector. Figure 16 shows the key findings.

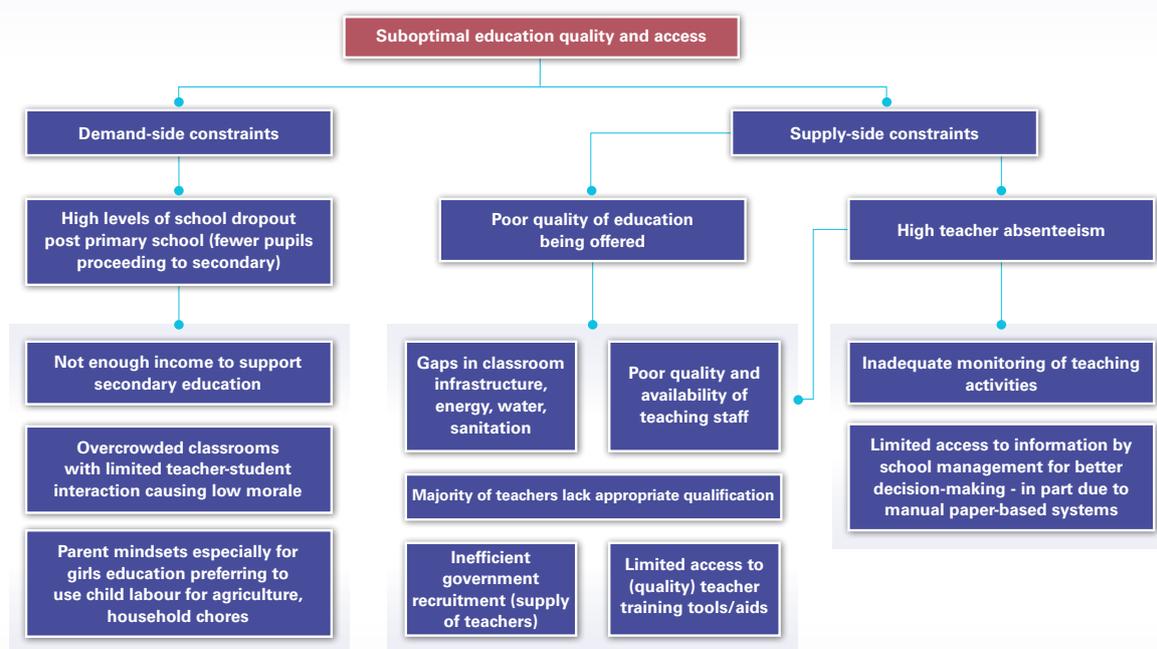


Figure 16. Constraints tree for secondary schools

It was observed that the district education officers (DEOs) and school administrators are key or central actors in the system. Thus, UNCDF strategies must entail addressing constraints related to the relationships between these central actors and other market players. Due to their network centrality, these actors also provide a key leverage point for UNCDF activities.

Complementing ongoing government efforts, innovations such as digital education in general, and mobile learning, offer several possible benefits to alleviate the constraints. These include access to low-cost teaching resources, added value compared with traditional teaching, and a complementary solution for teacher training.

Additionally, digital education provides an opportunity for easy management of school operations, a data-driven platform for better decision-making in the education sector, and recurring payment for the underserved community.

It has been shown that the use of digital solutions may have a tremendous impact on the education system in general by addressing some of the well-known constraints.

### System strategy

The MoES implements policies and strategies to improve the quality of education among the different pillars of the sector. The ministry is implementing an EMIS tool to enable data collection and better decision-making based on data. The EMIS is the foundation for the digitalization of key pillars under the digital agenda of the MoES. The MoES believes that digital tools can contribute to alleviate or address some of the market constraints in the education sector. UNCDF identified five areas of focus that can be addressed using digital technology at the district, school, community and ministry levels (Table 8).

**Table 8.** Focus areas for digital solutions in the primary and secondary education market of Northern Uganda

System parameter	Baseline status	UNCDF strategy	Desired system state
Reduce student post-primary school drop-out	82% drop-out after primary school	Improve school fee payments and affordability	Drop-out reduced to 72% by 2024
Reduced teacher absenteeism in school	Absent 1/3 of the school time	Digital school management systems	10% - 20% absenteeism (time basis)
<ul style="list-style-type: none"> <li>Improved literacy rate (population above 10 years old)</li> <li>Secondary teachers' skills improved with regard to new secondary school curriculum</li> </ul>	Literacy rate of 72.2%	E-learning solution targeting secondary school teachers	<ul style="list-style-type: none"> <li>Literacy increased to 80%</li> <li>50% of teachers trained on the e-learning platform report the ability to deliver new secondary school curriculum</li> </ul>
Expedite teacher recruitment and improve student learning experience satisfaction (retention)	Pre-project(s) kick-off baseline to be determined with assessment	<ul style="list-style-type: none"> <li>E-recruitment solution to improve the recruitment process</li> <li>Student e-learning solutions</li> </ul>	<ul style="list-style-type: none"> <li>40% reduction in recruitment time</li> <li>Ratio of 35 students per teacher</li> <li>Students are satisfied with the e-learning platform and use it to supplement face-to-face training</li> </ul>



An inclusive digital economy and development in education will ensure that everyone has the right skills for an increasingly globalized world. It is essential to promote inclusive labour markets that spur innovation, productivity and growth. Lack of infrastructure (power and connectivity), digital literacy and availability of financial resources are the main factors of low usage of digital solutions in the education sector.

However, there are new and flexible innovations using green energy, offline capabilities and strategic partnerships to give underserved communities access to digital services.

A market system approach to digital education will allow UNCDF to work in collaboration with key stakeholders to address some of these key constraints. Strategic partnership with market players will be developed to bridge the gap and a 360-degree approach to digitalization will allow the market system to leverage digital solutions for better school management, data-driven decision-making, flexible school fees payments, smart learning distribution channels and recruitment of personnel.

## 3.4 DIGITAL SECTOR

### SECTOR BACKGROUND

The Government of Uganda sees ICT as a strong contributor to its Vision 2040<sup>13</sup> – which will see the country transition into a “Modern and Prosperous Country.” In the National Development Plan (NDP III), ICT is identified as a fulcrum of development, an accelerator, amplifier and augments of change. Specific digital transformation objectives in NDP III include:

- increase the national ICT infrastructure coverage
- enhance use of ICT in national development and service delivery
- promote ICT research, innovation and commercialization of indigenous knowledge products
- increase the ICT human resource capital
- strengthen the policy, legal and regulatory framework.

Uganda’s digital economy has thus far been mainly driven by the mobile telecommunications sector. The mobile sector currently has an estimated 28.4 million subscribers (67 percent of the population). Mobile is also driving Internet penetration, with 9.8 million mobile Internet subscribers compared with 0.7 million fixed-line Internet connections.<sup>14</sup>

Mobile money – a subsector of the telecoms sector – has grown significantly and is now a major player in the financial services sector with current active mobile money users estimated at 15.5 million.<sup>15</sup>

Over the last five years, mobile money has been the major driver of financial inclusion with 56 percent of the financially included population using mobile money against the 11 percent who own a bank account.

ICT access and usage in Uganda has been growing over the past seven years (see Table 9A); however, the country is outpaced by regional peers Kenya and Rwanda (Table 9B).

**Table 9B.** A regional comparison of ICT access and use in 2019

Table 9B	Access	Use	Total	Total
<b>2019</b>	Score out of 100	Ranking (developing countries)	Score out of 100	Ranking (developing countries)
Uganda	26.9	120	15.9	113
Kenya	39.6	104	17.6	112
Tanzania (2018)	25.2	120	7.5	122
Rwanda	27.8	119	19	110
Burundi	24	122	6.1	126

**Table 9A.** Growth in ICT access and usage in Uganda

Table 9A	Score out of 100	
	2019	2013
ICT infrastructure	40.50	14.6
ICT access	26.90	19.1
ICT use	15.9	2.2

Source: Global Innovation Index (GII, 2019).<sup>16</sup>

<sup>13</sup> National Planning Authority, ‘Uganda vision 2040’. [www.npa.go.ug/uganda-vision-2040/](http://www.npa.go.ug/uganda-vision-2040/) (accessed 22 January 2021).

<sup>14</sup> Uganda Communications Commission, *Telecommunications, Broadcasting & Postal Markets: Industry Report Q3, September 2019 (Kampala, 2019)*. [www.ucc.co.ug/wp-content/uploads/2017/09/Communication-sector-performance-Report-for-the-quarter-ending-September-2019.pdf](http://www.ucc.co.ug/wp-content/uploads/2017/09/Communication-sector-performance-Report-for-the-quarter-ending-September-2019.pdf)

<sup>15</sup> Bank of Uganda, *Annual Report 2019/20 (Kampala, 2020)*. [www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/publications/Annual\\_Reports/All/Annual-Report-2019-2020.pdf](http://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/publications/Annual_Reports/All/Annual-Report-2019-2020.pdf)

<sup>16</sup> Soumitra Dutta, Bruno Lanvin and Sacha Wunsch-Vincent, editors, *Global Innovation Index 2019: Creating Healthy Lives – The Future of Medical Innovation*, 12th ed. (Ithaca, Cornell University; Fontainebleau, INSEAD; Geneva, World Intellectual Property Organization, 2019). [www.ifpma.org/wp-content/uploads/2019/07/wipo\\_pub\\_gii\\_2019.pdf](http://www.ifpma.org/wp-content/uploads/2019/07/wipo_pub_gii_2019.pdf)

There are significant regional disparities in access and usage of ICT within the country. Within the target region of the UNCDF digital programme, telecoms penetration in Northern Uganda by the two major providers is much lower than their national market share (Table 10A).

Similarly, available data from NITA-U<sup>17</sup> ranks the Northern Region lowest in terms of 3G network availability compared with other regions in Uganda (Table 10B). 3G is the minimum needed for most digital-enabled services.

### Uganda mobile network coverage (March 2018).

Source: Uganda Communications Commission

Table 10A

Market share		
	North and West Nile	National
MTN	24%	45%
Airtel	13%	37%

Table 10B

Coverage by region	Geographic coverage			Population coverage		
	2G	3G	4G	2G	3G	4G
Central	78%	48%	9%	99%	88%	53%
Eastern	84%	51%	4%	99%	82%	15%
Northern	78%	31%	1%	96%	65%	9%
Western	93%	55%	2%	98%	78%	8%
Total	83%	44%	4%	98%	78%	23%

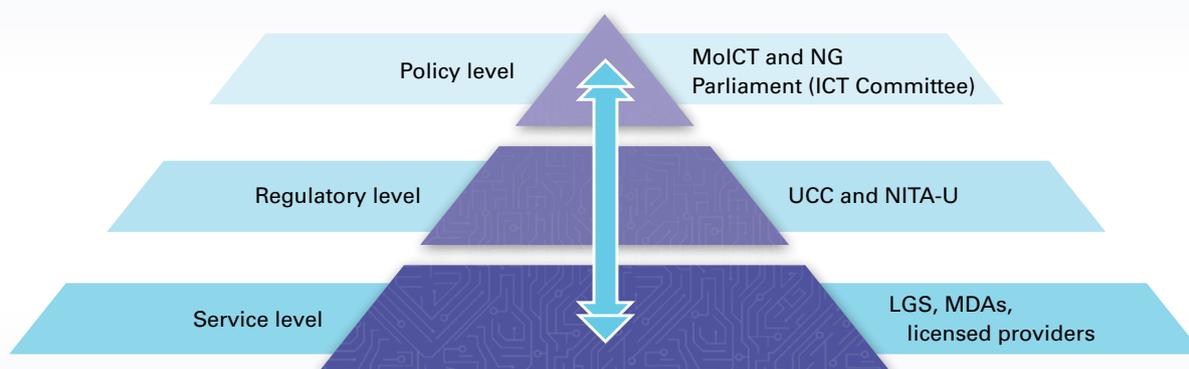


<sup>17</sup> Available from GSMA Report (<https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/03/Uganda-Report-Driving-inclusive-socio-economic-progress-through-mobile-enabled-digital-transformation.pdf>)

## SECTOR DYNAMICS

To understand the dynamics of the sector in Uganda, it is important to understand how the sector is structured. The Ministry of ICT and National Guidance oversees the sector at the national level, setting the policy direction

for the sector and ensuring that there is a conducive environment for the growth of the digital economy. Table 17 shows the functional level of the digital sector in Uganda.



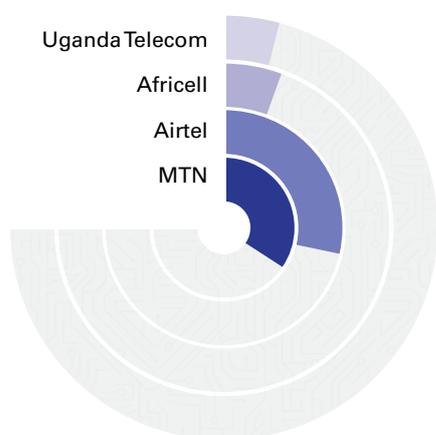
**Figure 17.** *The functional level of the digital sector in Uganda*

*Abbreviations:* MDAs, ministries, departments and agencies; MoICT&NG, Ministry of ICT and National Guidance; LGs, local governments; NITA-U, National Information Technology Authority – Uganda; UCC, Uganda Communications Commission.

**Source:** Research ICT Africa 2019

Uganda Communications Commission (UCC) regulates the sector, and the National Information Technology Authority – Uganda (NITA-U) ensures the harmonization of all efforts to digitalize government services. At the service-delivery level, there are various government ministries, departments and agencies, local governments and various licensed private sector providers of digital services.

The telecommunications subsector, the largest provider of digital services, is dominated by two major players, which hold an estimated 82 percent of both mobile communications and the mobile money market (see Figure 18). A good understanding of the structure of the market has been key in informing the projects' structuring for the programme in the UNCDF targeted regions.



**Figure 18.** *Market share in the telecoms sector*

<sup>18</sup> Available from ([https://researchictafrica.net/wp/wp-content/uploads/2019/05/2019\\_AfterAccess-The-State-of-ICTin-Uganda.pdf](https://researchictafrica.net/wp/wp-content/uploads/2019/05/2019_AfterAccess-The-State-of-ICTin-Uganda.pdf))



**Figure 19.** *Ecosystem actors in the digital sector*  
 Abbreviations: MDAs, ministries, departments and agencies; MFIs, microfinance institutions; MNOs, mobile network operators.

## SECTOR CONSTRAINTS ANALYSIS

The hexagonal diagram (Figure 19) provides some examples of the interconnectedness among actors in the sector. Rural people mainly use the communications services of mobile telecoms operators, but, in line with that, they need to acquire phones and also visit telecom agents. All that is not possible unless the user has a valid national ID to be able to register for the telecom services – hence the interaction with government. On the other hand, mobile operators also have to deal with handset sellers and manufacturers, because the services of the former cannot be consumed without the presence of a handset.

The hexagonal diagram was used to identify key constraints in the sector. The programme inception study and previous studies<sup>18</sup> highlighted various challenges in the digital sector, which are categorized by the four components of the digital economy (Table 11).

**Table 11.** Constraints in the digital sector

Digital economy component	Thematic challenges
Enabling policy and regulation	<ul style="list-style-type: none"> <li>Limited capacity to supervise and monitor the rapidly evolving digital landscape</li> <li>Limited approach to digitalization across sectors</li> <li>Unfavourable/unpredictable policy and regulatory regime (e.g. taxation, shutdowns)</li> <li>Unclear payment service provider (PSP) licensing</li> <li>Know your customer (KYC) regime challenging for last-mile market</li> <li>Lacking government proactivity for digital economy</li> <li>Data protection issues and privacy</li> <li>No incentives for innovation and start-ups' development</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>Limited network coverage at the last mile</li> <li>Low phone penetration</li> <li>Limited access to power for device penetration</li> <li>Weak last-mile distribution for various services (finance, energy, agriculture, education, health, etc.)</li> <li>Limited open digital infrastructure</li> <li>Lack of digital identity</li> </ul>

<sup>18</sup> United Nations Capital Development Fund, Study on Uganda's market readiness for digital financial services plus (New York, 2018).

Table 11. Continued

Digital economy component	Thematic challenges
Inclusive innovation (innovation ecosystem)	<ul style="list-style-type: none"> <li>• Lack of relevant digital solutions</li> <li>• A young and fragmented innovation ecosystem</li> <li>• Lack of structure and leadership in the ecosystem</li> <li>• Many early stage, unproven business cases</li> <li>• Low skills among start-ups (lack of proper mentorship and capacity-building)</li> <li>• Lack of financing options at all stages of innovation</li> <li>• Lack of adequate international visibility for Ugandan innovations/start-ups</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Low digital literacy</li> <li>• Low financial literacy</li> <li>• Traditional practices and norms that hinder adoption of innovations</li> <li>• Low use of digital technology to develop soft and hard skills</li> </ul>

A constraint tree was developed from the findings of the inception study and secondary research (Figure 20).

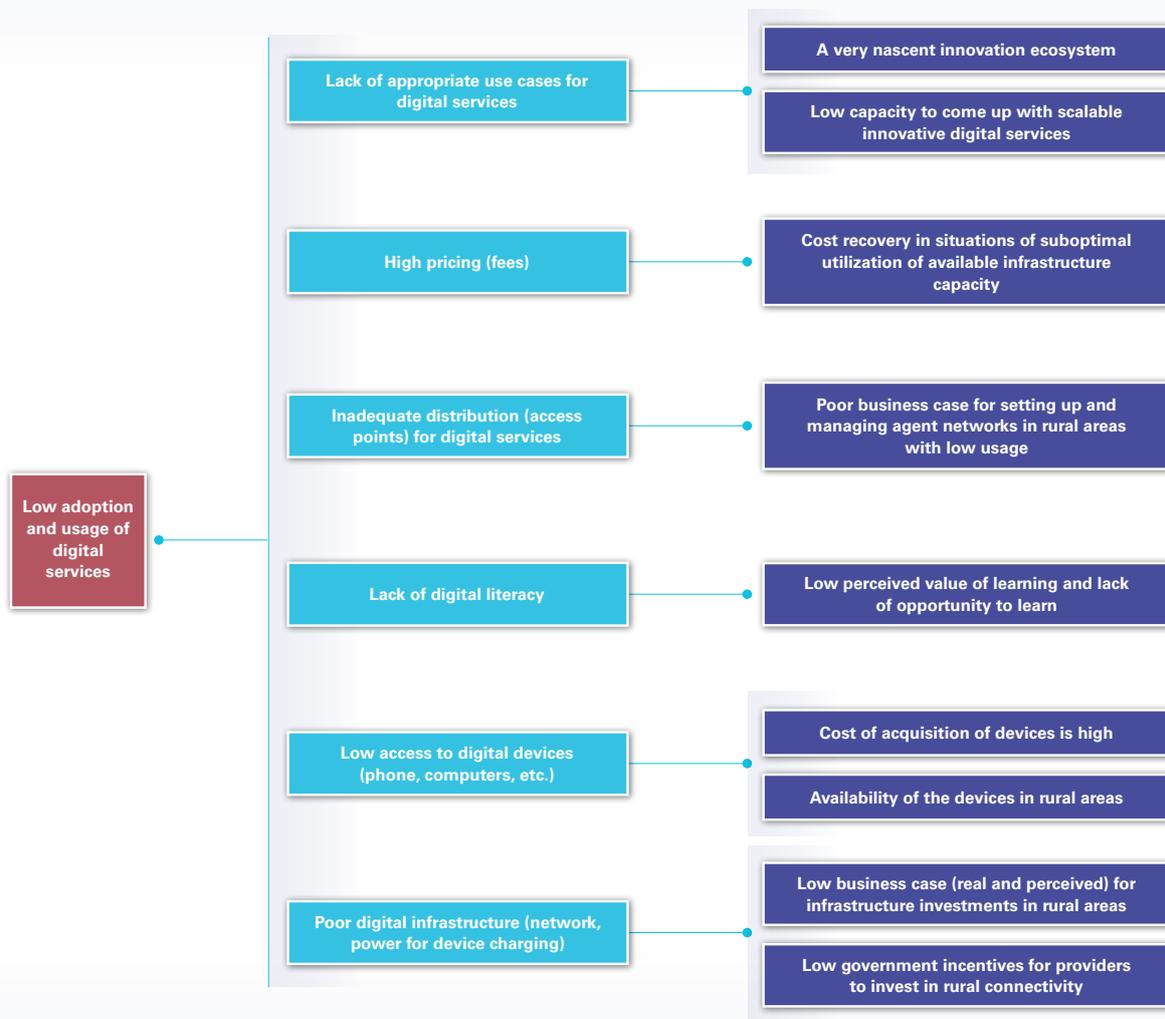


Figure 20. Constraint tree for the digital sector

As shown in Figure 20, at the base of it all, the digital sector requires that there is infrastructure for connectivity, and electricity to power digital devices. The challenge here is that there is still little incentive for the private sector to extend infrastructure to rural areas. Infrastructure is the barrier to access to digital devices (phones, computers, tablets, etc.) for the last mile. This is both a result of low purchasing power and the unavailability of such devices at the last mile. Once people have acquired devices, the next hurdle that needs to be addressed is the ability to use the devices to access various services. This is not just an issue of low literacy levels but also of willingness – where they might not see the value of learning about new services or they may lack the opportunity to learn. The inadequacy of access points (e.g. mobile money agents) for digital services at the last mile is also a big barrier to adoption. Then comes the issue of pricing, whereby the fees for using digital services are regarded as high compared with business as usual (i.e. using cash). For the supply side, the pricing is largely to make sure the suppliers can break even on the huge investments needed to connect the last mile. There is also the issue of lack of relevant use cases for last-mile users. Indeed, rural communities require a customized value proposition – as opposed to exporting services from urban to rural. Such customized digital services addressing the particular needs of underserved communities are still scarce, and the local innovation industry is still at a nascent stage and therefore unable to adequately serve this purpose in the near term.

So, the challenges are a mix of supply-side and demand-side constraints that need to be addressed concurrently to be able to move the needle on digital adoption and usage for the last-mile population.

## SECTOR VISION AND STRATEGY

On the basis of the sector profile and dynamics on one side and the sector challenges and problem tree on the other, the programme came up with the following vision and strategy.

### Vision:



- **At national level, the digital goal by 2023:**
  - Digital Economy Score increases from 44 percent to 58 percent<sup>19</sup>
  - Digital Inclusiveness Score increases from 20 percent to 40 percent<sup>20</sup>
- **At project level, the digital access goal by 2023:**
  - 1 million rural people receive digital literacy training
  - 300,000 new rural users of digital services.

## SYSTEM STRATEGY

The UNCDF strategy for the digital sector, therefore, combines interventions on the supply side and demand side, at macro level (e.g. with policymakers), at ecosystem level (e.g. with industry associations) and also at micro level (directly reaching the last-mile communities).

The UNCDF general strategy for developing the digital sector is summarized under the four key intervention areas.

### 1. Government of Uganda implements policies that enable access to and usage of digital services

- Convene the key actors in the sector in the digital transformation sector working group
- Technical assistance to mainstream digitalization into all programmes of NDP III
- Technical assistance to draft ICT innovations policy
- Policy diagnostic study for digital economy – to inform the needed policy changes.

**Partners:** Ministry of Information and Communications Technology (MoICT), NITA-U, National Planning Authority (NPA).

<sup>19</sup> The Digital Economy Score measures the development of a national digital economy and its main components (enabling policy environment, mobile infrastructure and digital payments, innovation ecosystem and customers skills).

<sup>20</sup> The Digital Inclusiveness Score measures the level of inclusion in the digital economy for key customer segments (rural, women, youths, elderly, refugees, migrants, disabled, MSMEs).

**2. Rural community members have improved access to and increasingly use digital payment accounts**

- Providers improve infrastructure and distribution, and provide relevant products and services for rural users
- Increase access to devices (accessibility and affordability)
- Promote open ecosystems (application programming interfaces [APIs], data) to enable interoperability and innovation.

**Partners:** mobile network operators (MNOs), banks, device providers, last-mile distributors.

**3. Uganda’s start-up ecosystem is convened and engaged to better provide support to start-ups and drive digital innovation in Uganda**

- Strengthen the capacity of Start-Up Uganda – an association for start-up hubs (innovation support organizations)

- Create linkages between the public and private sector, and international start-up ecosystems.

**Partners:** Start-Up Uganda, innovation hubs, National ICT Initiatives Support Program (NIISP), MoICT.

**4. New business models and technologies in agriculture, health, education and finance are tested and scaled**

- Identify promising innovations – support them to pilot and scale
- Identify community challenges and invite innovators to tackle them (challenge-based innovation journey).

**Partners:** innovators in agriculture, health, education and finance.

Specifically, for the target region of Northern Uganda, the strategy is provided in Table 12.

**Table 12.** Digital market in Northern Uganda

System parameters	Baseline status	UNCDF strategy	Desired system state
Access to phones, SIM cards and phone-charging options	Status in Northern Region and West Nile subregion is well below the national average of 44% of adults owning a phone	<ul style="list-style-type: none"> <li>• Partnerships with telecoms companies and device distributors to improve access to and pricing of devices, and provide payment plans</li> <li>• Community-based distribution system – ‘digital community entrepreneurs’</li> </ul>	30% growth in SIM-card ownership and mobile money uptake by end 2023
Access points for digital services (agents, merchants, sales points)	Below national average	<ul style="list-style-type: none"> <li>• Partnerships with telecoms companies, community-based service providers (groups, savings and credit co-operatives [SACCOs])</li> <li>• Community-based distribution system provided by Digital Community Entrepreneurs ‘digital community entrepreneurs’</li> </ul>	<ul style="list-style-type: none"> <li>• 400 new agents in the region</li> <li>• 600 new merchants</li> </ul>
Digital literacy among target users to make good use of digital	Low – also reflected in current usage levels	<ul style="list-style-type: none"> <li>• Community-based digital literacy system provided by Digital Community Entrepreneurs ‘digital community entrepreneurs’</li> </ul>	1 million people are trained on basic use of phones and relevant digital services

Table 12. Continued

System parameters	Baseline status	UNCDF strategy	Desired system state
Open payments / data systems	Non-interoperable systems (infrastructure, applications)	<ul style="list-style-type: none"> <li>• Work with ecosystem actors to foster open data and application programming interfaces (APIs), i.e banks, telecom companies, regulators</li> <li>• Innovation challenges with innovators to leverage open data / open APIs</li> </ul>	<ul style="list-style-type: none"> <li>• Increased awareness about open APIs / open data in the industry</li> <li>• At least 2 institutions open their APIs</li> </ul>
Convening the sectors and ecosystem actors towards a harmonized strategy and implementation	Quite disintegrated activities happening among different sector stakeholders	<ul style="list-style-type: none"> <li>• Mainstream digital in NDP III</li> <li>• Support the ICT (digital transformation) sector working group</li> <li>• Support to Start-Up Uganda (convening body of innovation hubs)</li> </ul>	<ul style="list-style-type: none"> <li>• A functional sector working group – working towards achieving a digitalization agenda in NDP III</li> <li>• A stronger start-up ecosystem</li> </ul>



# 4.

## MONITORING AND MEASUREMENT



*The inception study used a mixed methods approach, which facilitated the capture of both qualitative and quantitative data from primary and secondary sources.*

Initially, there was desk research to gain a better understanding of the market systems of each sector. The sampling method was based on the following criteria: relevance to the target group (rural population, women, youth, refugees, MSMEs), constraints and opportunities for market growth (inclusive growth/access potential), feasibility of intervention, and existing development efforts (potential synergies).

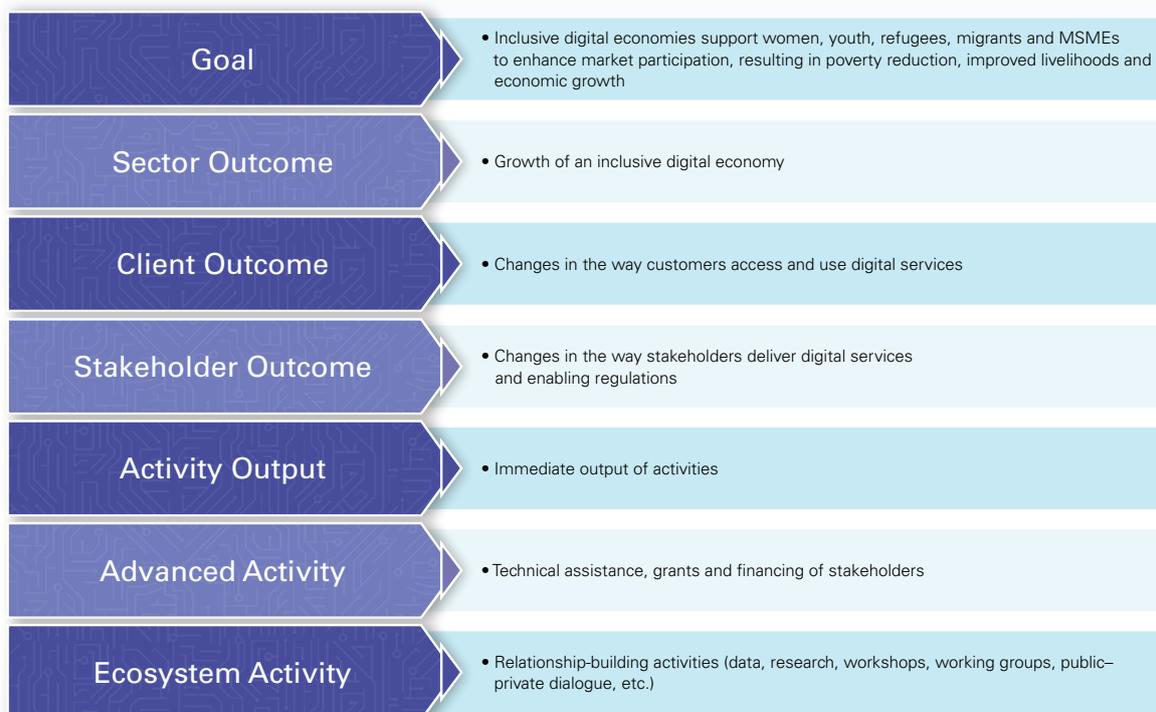
Six market systems – primary education, secondary education, primary health, food crops, cash crops and retail – were selected, and a desk review was done to gain a high-level understanding of these market systems in Northern Uganda. A total of 40 stakeholder organizations, ministries and agencies’ representatives from the seven selected market systems were interviewed during the field visit. The study was conducted over a period of about three months, covering Northern Region and, in particular, West Nile subregion in Uganda, targeting women, youth and refugees. Data analyses involved content and thematic analysis to filter out the different emerging constraints in the market based on the different sectors and thematic areas in the priority market systems.

The study methodology enabled UNCDF to determine the constraints (in depth) in the different sectors to be able to design innovative solutions to mitigate the constraints using the Adopt, Adapt, Expand and Respond (AAER) framework that looks at which activities are right to address these constraints; what output to expect, and what stakeholder, clients and sector outcomes we expect to contribute to the ultimate goal – so that monitoring is checking whether the intervention is giving the expected changes.

The study also allowed UNCDF to better understand the key constraints affecting the target groups (the stakeholders in the market). This informed the development of the theory of change by providing information of the possible activities to be implemented in each sector then drawing the causal linkages to the expected outputs, stakeholder outcomes, client outcomes, sector outcomes and the goal. This required alignment with elements of the Donor Committee for Enterprise Development (DCED) standard at three different levels – micro (intervention results chain), meso (systemic change – AAER) and macro (tracking country-level indicators). The theory of change (Figure 21) illustrates the causal change pathways that the inclusive digital economies programme hypothesizes will enable it to change the market system.

**Figure 21.** Theory of change

Abbreviations: MSMEs, micro, small and medium-sized enterprises.



Additionally, the study revealed the expected “institutional and behavioural change through detailed analysis of local contexts.”<sup>21</sup> This informed the project from a realist evaluation angle<sup>22</sup> that context triggers impact:

- some mechanisms in the project context or market need to be triggered for impact to be realized
- it takes longer to realize impact at beneficiaries’ level, which is usually beyond the direct control of the programme.

Therefore, it is crucial for programmes following a market system approach to continuously monitor and track progress so that effective learning and adaptive management can be used. Thus, results measurement (RM) is a crucial component of a market system programme.

Chronologically, the finalization of the theory of change informed the development of a subset of RM tools, such as the country Results Management Framework (RMF), results chains for the different projects, and measurement plans. With these tools, the programme is able to monitor the progress in a systematic manner and draw lessons.

The study informed UNCDF of the core indicators and data required to track progress towards indicator target achievement, required data sources, timing for collection of data and the tools to be used in the data collection, and responsible persons/organizations to further streamline the RM system. As a result, UNCDF developed data collection plans that show the indicator required, data sources, frequency for collection, and responsible persons/entities. This ensures that the RM system abides by sound research methodologies.



<sup>21</sup> B. Taylor, ‘In vogue and at odds: systemic change and new public management in development’, *Enterprise Development and Microfinance*, vol. 25, no. 4 (2014), pp. 271–287.

<sup>22</sup> Realist evaluations are based on the assumption that projects and programmes work under certain conditions, and are heavily influenced by the way that different stakeholders respond to them. Consequently, it is important for development practitioners and policy-makers to understand how and why projects and programmes work in different contexts. This means they will be better able to make decisions about which projects and programmes to run, and how to adapt them to different circumstances. Reference: Stern, E (2015). *Impact Evaluation: A guide for commissioners and managers*. BOND, May 2015

**Table 13.** UNCDF Results Measurement Framework (RMF) data collection plan

Results Measurement Framework (RMF) indicator	Data source	Frequency of collection	Responsible persons
Activity-level indicators, e.g. value of UNCDF investments, value of partner investments due to UNCDF support; and stakeholder outcome-level indicators, e.g. number of policies, regulations and standards introduced or improved	Document review	Quarterly	UNCDF project staff
Activity-level indicators, e.g. number of capacity-building activities, number of participants in capacity-building activities	Knowledge management dashboard	Quarterly	Knowledge management team
Indicators at output to customer outcome levels, e.g. number of new or improved digital services and business models piloted, number of registered customers of new or improved digital services supported by UNCDF, number of active customers of new or improved digital services supported by UNCDF	Partner reporting	Quarterly	UNCDF staff
Indicators at output to customer outcome level, e.g. number of responsive policy measures related to the inclusive digital economy initiated, number of other agricultural value chain actors with improved performance	Key Informant Interviews (KII)	Semiannual to annual	UNCDF staff
Client outcome and goal level indicators, e.g. number of people with access to improved health care services, number of people served by community health workers who report improved health outcome	Impact assessment	Annual	Results management (RM) team
Inclusive Digital Economy Scorecard Uganda	Inclusive Digital Economy Scorecard (IDES)	Annual	RM team

Table 13. Continued

Results Measurement Framework (RMF) indicator	Data source	Frequency of collection	Responsible persons
Primarily will be used to collect data on the output-level indicator “number of partners showing increased commitment in improving or expanding the business models” and sector outcome-level indicator “value of non-UNCDF external funds mobilized due to UNCDF support”. However, because of the nature of systemic change study, it will draw on findings from other sources and indicators	Systemic change case study	Project end	RM team
Goal-level indicator: How the inclusive digital economy reduces poverty, increases resilience and improves economic opportunities for women, youth, refugees, migrants and MSMEs	Vulnerability study	3 months to project end	RM team

The study also informed UNCDF of the market players and hence the results measurement framework started to address the measurement of contribution and attribution. UNCDF decided that at the goal and sector levels, it will not measure attribution but instead focus on **contribution to impact**. This is in line with the industry guidelines.<sup>23</sup> However, UNCDF aims to assess plausible attribution at client outcome level through the impact assessments, though in the higher levels of the theory of change external factors have an increasing influence. UNCDF will undertake a landscape study to gather quantitative data and baseline information on the various sectors.

The inception study has provided UNCDF with identified areas where more targeted data collection activities (e.g. landscape study) will be launched. This will improve the programme’s evidence base for decision-making and further improving strategies. It is envisaged that pause-and-reflect workshops will be carried out to discuss findings and update strategies on a semiannual basis.

<sup>23</sup> Patrick Spaven and Karina Broens Nielsen, *Measuring Market Development: A Handbook for Funders and Implementers of Financial Inclusion Programs* (Washington, D.C., Consultative Group to Assist the Poor/World Bank Group, 2018). [www.cgap.org/research/publication/measuring-market-development](http://www.cgap.org/research/publication/measuring-market-development)



# 5.

## LESSONS LEARNED FROM APPLYING THE MSD APPROACH

*Early lessons from the inception study and applying the MSD approach to build inclusive digital economies.*

1. **Address underlying constraints:** When applying an MSD approach, it is important to address underlying constraints as well. To identify digital solutions to some of the challenges in the social and economic sectors in Uganda, we identified some systemic constraints that could not immediately be addressed by digital solutions. For instance, to help farmer organizations to strengthen their operations and enhance their business processes using digital solutions, there is a need to support their organizational structures as well. Similarly, to address key challenges in the health care sector, a system change is needed to deliver quality care to patients.
2. **Actors are interconnected:** The study highlighted the interconnectedness between all the market actors in all the sectors. As such, it is important to establish incentives for all the actors, as well as the key entry points for each actor.
3. **Align incentives and activities of different actors:** To address the main constraints in the health, education, agriculture and digital sectors, it will be key to align incentives and activities of different actors. For instance, when dealing with student absenteeism, it is important to establish alignment between the incentives for administrators and those for teachers. One way to align the incentives of the education planners at national government and district levels is to improve the data collection, analysis, management and sharing between the two parties, so that they can collectively agree on the priorities in budget decisions, taking into account the needs and activities occurring at the district level.
4. **Demand-driven government decision-making:** Although lack of resources underlies many of the issues, particularly in the health and education sectors, most of the constraints are due to the lack of demand-driven decision-making based on facilities' and schools' demand volume. To address these issues, it will be important to demonstrate to the government the importance of making demand-driven decisions and provide reliable and consistent information necessary to make those decisions. Broadly, digital approaches can consistently provide the accurate data required. However, for this solution to succeed, it should be within country priorities and align with government priorities for continuity.
5. **Be cognizant of gender disparities:** Key lessons from constraints analysis are that digital solutions can potentially reinforce gender divisions if gender disparities are not clearly visible in planning data. Clear tracking and reporting of gender disparities can flag such actions for investigation – but this requires capacity to monitor and take action on these disparities. For instance, women are less likely to own mobile phones, so single mothers are disproportionately less likely to be able to use digital solutions and therefore gain access to payments or mobile money credit products. Mobile money solutions could transfer payment responsibility to men within families, sidelining women from financial decisions. Women often have less access to collateral, and to digital devices to access credit, so such digital interventions risk women falling further behind in productivity. Helping women get better access to phones and mobile money accounts can mitigate much of the disparity. Care must be taken when proposing a new digital platform in terms of who would be able to use it, and to ensure training where needed does not disadvantage women. In the health and education sectors, digitalization of recruitment processes can address challenges that limit women's employment in these sectors, such as location of work. Digital solutions such as e-recruitment can ease the process of allocation of workers to preferred duty stations.
6. **Constraint analysis and sector review is an iterative process, not a one-time exercise:** Market dynamics are constantly evolving, new actors are emerging as are opportunities and challenges. It is therefore important to have a robust results measurement system that allows for feedback to ensure evidence-based decision-making. The inception study is the first attempt in fine-tuning UNCDF strategy. As more projects are implemented and results measurement data are collated, these strategies will be updated and adapted through pause-and-reflect sector reviews.

## CONCLUSION

Based on the findings of this study, and the subsequent strategies to address the identified challenges, UNCDF is leveraging digital tools to level the playing field – so that we can transform the lives of the underserved by enabling them to access and use digital services that improve their well-being. The vision that guides our work is one in which deploying innovative approaches that crowd-in public and private finance can create the demonstration effects that develop and transform markets, shift the dynamics of financing towards the local level, and ultimately catalyse systemic change.

We recognize that an inclusive digital economy will only be realized when we move together. As a result of this robust process, UNCDF is focusing on alleviating challenges in the education, health, agriculture and digital sectors through collaboration with government, private sector and academia, while paying particular attention to developing the right services that reduce the digital divide and empower key customer segments.

UNCDF is committed to continuing its strong collaboration with these stakeholders to further develop a digital economy in Uganda that leaves no one behind.





Unlocking Public and Private  
Finance for the Poor



## LEAVING NO ONE BEHIND IN THE DIGITAL ERA

The UNCDF strategy 'Leaving no one behind in the digital era' is based on over a decade of experience in digital financial inclusion in Africa, Asia and the Pacific. UNCDF leverages digital finance in support of the Sustainable Development Goals (SDGs) to achieve the vision of promoting digital economies that leave no one behind. The goal of UNCDF is to empower millions of people by 2024 to use services daily that leverage innovation and technology and contribute to the SDGs. To achieve this vision UNCDF uses a market development approach and continuously seeks to address underlying market dysfunctions that exclude people living in the last mile.

## ABOUT THE UN CAPITAL DEVELOPMENT FUND

The UN Capital Development Fund makes public and private finance work for the poor in the world's 46 least developed countries (LDCs). UNCDF offers "last mile" finance models that unlock public and private resources, especially at the domestic level, to reduce poverty and support local economic development.

UNCDF's financing models work through three channels: (1) inclusive digital economies, which connects individuals, households, and small businesses with financial eco-systems that catalyze participation in the local economy, and provide tools to climb out of poverty and manage financial lives; (2) local development finance, which capacitates localities through fiscal decentralization, innovative municipal finance, and structured project finance to drive local economic expansion and sustainable development; and (3) investment finance, which provides catalytic financial structuring, de-risking, and capital deployment to drive SDG impact and domestic resource mobilization.

### For more information, please contact:

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