FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Inclusive Digital Design Toolkit: Practical guidance for Feed the Future activities

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Disclaimer

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List of Acronyms

CIAT	International Center for Tropical Agriculture
COR	Contracting Officer's Representative
DAO	Decentralized Autonomous Oorganization
GDD	Gender digital divide
GDP	Gross Domestic Product
ICT	Information and Communication Technology
ITU	International Telecommunications Union
IVR	Interactive Voice Response
LLM	Large Language Model
ME(A)L	Monitoring Evaluation Accountability and Learning
MVP	Minimum Viable Product
REFS	Resilience, Environment, and Food Security
SMS	Short Message Service
TFGBV	Technology faciliated gender-based violence
UCD	User centered design
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data

Introduction

Purpose of the toolkit

Digital tools have become pervasive around the world, including within resilience, environment, and food security development efforts supported by USAID's Bureau for Resilience, Environment, and Food Security (REFS). Globally, reliance on digital tools to do everything from looking up a weather forecast on a smartphone to automating the analysis of complicated datasets through cloud computing is set to increase further over time. However, the ongoing digital revolution has also created new and unintended consequences. In the context of sustainable development this can manifest in unequal geographic spread, accessibility, usability, and benefit from digital solutions. Where smallholder farmers and other types of producers and micro, small, and medium enterprise (MSME) owners are born, what gender they identify as, their age and education level, the social norms they have grown up with, and many other factors impact their ability to effectively benefit from digital technologies.

Conversely, where, and how digital technologies that are deployed in Feed the Future (FTF) activities are designed, developed, and tested – and by whom – significantly impacts how relevant, accessible, usable, and valuable they might be for participants, from agricultural producers to input suppliers. If the people they are designed for do not have a stake in how they are developed or how they are governed and deployed, there is a greater chance that the tools will not be used as intended.

There are myriad ways in which factors related to, for example, accessibility, usability, and real life usage, affect both users and digital technologies. This inevitably results in a situation where certain groups of farmers are more likely to benefit from digital tools than others. For instance, landowning men who are digitally literate are likely to be better placed to benefit from the multiplying potential of digital tools than, say, a landless woman with minimal literacy and little access to, or experience with, digital tools. Thus, some people are in a more advantaged position than others. Without adequate planning and mitigation, digital tools can perpetuate and even worsen existing inequities and inequalities. In short, without due care and consideration for digital inclusion, digital tools may multiply benefits for those already in privileged positions. Simultaneously, the adverse effects for those left behind may multiply.

Who this toolkit is for

Whether you are just starting an activity design or implementation exclusively aimed at developing a new digital tool in Feed the Future activities, or if you are simply planning on using existing digital technology within development programming, this toolkit is for you. This toolkit has been designed to assist USAID staff and implementing partners to design and implement activities that:

1. Understand that potential users have complex realities that alter their ability to use, engage with, and benefit from digital tools.
2. Overcome the digital divides of access, digital literacy, and offline benefit[1] through inclusive digital design and program activities.
3. Utilize a Digital Inclusion Framework to assess and iteratively improve digital inclusion efforts.

The toolkit provides guidance to USAID staff and implementing partners on how to design inclusive digital technology interventions in Feed the Future activities. The toolkit pays specific attention to achieving positive

[1] Offline benefit refers to the idea that digital inclusion should lead to meaningful offline improvements in various aspects of life, such as livelihoods, income generation, food security, and resource management.

outcomes through digital technology interventions, considerations of marginalized groups and intersectionality, and engagement with relevant local actors in accordance with USAID's locally-led development objective.[2]

How to use the toolkit

You're in the driver's seat! This toolkit is designed as a practical guide to introduce you to digital inclusion, user readiness, inclusive programming, and examples of digital inclusion in action. Each Module combines informational content with mini cases to highlight elements of digital inclusion, peppered with activities to apply to your own self and activities you're working on, envisioning, and/or planning. The final module highlights the constraints of digital inclusion in practice and the activities ask you to reconcile the goals of digital inclusion with the realities of time, budget, and staff resourcing. A workbook with the activities, including worksheets, and fillable figures is included to support you and your team with implementing the toolkit content in your activities.

Value add: To date, there are very few frameworks in the digital inclusion space, especially as applied to international development. To this end, please check out the Intersectional Digital Inclusion Framework, which provides a structure for thinking about how to overcome digital divides by addressing and designing for existing inequalities and norms for more and more users. In doing so, this toolkit demonstrates how to apply intersectionality to activity design and implementation.

Using the internal jump links throughout the toolkit, you'll be able to quickly access the information you are most interested in.

- **New to digital inclusion?** Start with Module 1 and move through the toolkit in sequence to build your depth of understanding and practice.
- **Eager to understand intersectionality?** Familiarize yourself with the key terms and definitions that make up intersectionality and then learn how to bring an intersectional lens to digital development work.
- **Familiar with social inclusion but new to technological design processes?** Start with Module 2 to learn about how digital solutions get made from ideation to testing.
- **Want to incorporate a digital intervention into a current or upcoming activity?** Head to Module 3 to learn how to incorporate inclusive programming.
- **Learn best from examples?** Head to Module 4 where you can see digital inclusion in action.
- **Only have a few minutes?** Check out the key takeaways at the end of Modules 1, 2, 3 and then use the jump links to get a closer look at any content that interests you. But don't forget the applied cases in Module 4!

Module 1: Building Blocks for Digital Inclusion

In Module 1, we introduce the building blocks that, together, create a new Intersectional Digital Inclusion Framework. First, it covers digital inclusion broadly and demonstrates how overcoming digital divides is interlinked. Second, it introduces intersectionality as a concept that can help you understand the opportunities and challenges that different individuals experience. Then, armed with an intersectional understanding, it reviews user personas common in development settings. Lastly, this knowledge is used to create a new framework which assists with conceptualizing progress toward digital inclusion. Throughout this module, several activities ask readers to apply how they, themselves, have overcome digital divides given their unique identities and experiences.

Module 2: Assessing user readiness using intersectionality

In Module 2, we take a closer look at understanding and working with intersectional participants and apply Module 1 content to the potential users of digital solutions. First, the Intersectional Digital Inclusion Framework and

[2] USAID. n.d. Local Capacity Strengthening Policy. Available online.

personas are leveraged to help identify which users you may want and need to design programming for. Second, it introduces the idea of user readiness and why this is important for inclusive digital designs. Third, it provides guidance for planning and implementing an inclusive design process. Throughout this module, several activities ask readers to empathize with the user groups with which they work and for whom they design a digital intervention.

Module 3: Incorporating Digital Inclusion within Activity Implementation

In Module 3, we outline key moments across the activity lifecycle where inclusion may be proactively planned for and addressed. First, we review different pathways to incorporate digital inclusion and detail the importance of focusing on offline benefit for FTF activities. Second, we introduce a digital inclusion continuum, which helps implementing partners (IPs) determine which digital inclusion approach aligns best with their objectives and resources and Contracting Officer's Representatives (CORs) proactively manage for digital inclusion. Third, we demonstrate different opportunities to apply the digital inclusion framework to make strategic and tactical decisions and course corrections during implementation. Throughout this module, activities ask readers to assess their current activity programmatically and technically to enhance digital inclusion.

Module 4: Case studies and constraints to implementing inclusive digital design

In Module 4, we deep dive into what digital inclusion looks like during implementation. Each case study includes a description of the intervention, the solution, and steps taken to address access, digital literacy, and offline benefit. Across all the case studies, common constraints to implementing the inclusive design process in practice are identified, and recommendations on how to mitigate these constraints are provided.

Module 1: Building Blocks for Digital Inclusion

Digital Inclusion

Digital tools can serve as powerful catalysts across Feed the Future programming, helping participants to achieve more productive and resilient on and off-farm livelihoods. Yet, real world inequalities often translate into digital ones. For example, engagement with digital tools among female farmers in Kenya is highly skewed towards those with higher educational attainment and living nearer urban areas.[3] The global digital divide–unequal access to digital technologies worldwide–results in economic, social, and educational disparities. Globally, those with meaningful digital connectivity generated over $4.5 trillion, equivalent to 5% of the global gross domestic product (GDP) in 2021.[4] Meanwhile, approximately one-third of the world's population, around 2.7 billion people, remained fully unconnected in 2022 and many others lack consistent internet access, hindering improvements in their daily lives.[5] Despite increased connectivity and initiatives to remove digital divides, some individuals and groups remain hard to reach or entirely excluded from the potential benefits of digital technology. For example, Lesotho has made significant progress in extending mobile networks to more than 90% of its population, yet less than half of the population use the internet.[6] Privileged groups, such as men, lead farmers, and small and medium enterprise (SME) owners with better resources and networks, disproportionately gain from digital engagement, while women and marginalized communities often miss out. Digital inclusion occurs when an individual can access, engage with, and receive benefits from their use of digital tools.

> *"It doesn't matter if you have internet coverage if you can't afford a data bundle. It doesn't matter if you can get online if public services are not in a language you understand. It doesn't matter if you can get online if you don't know how to use an internet browser."*
> (Robert Opp, Chief Digital Officer, UNDP)[7]

As technological advancements in agricultural development increase–text-based extension services, precision agriculture, climate prediction paired with automated farmer payouts–addressing inequities in people's abilities to engage with digital tools is imperative and pressing. Feed the Future (FTF) activities contribute to stronger food systems, better nutrition, and greater resilience to shocks and may, or may not, engage a digital intervention to help achieve these goals. For the activities that choose to engage digital tools to enable development outcomes, the portion of the activity which does so is the **digital intervention**. FTF activities with a digital intervention aims to ensure that included individuals, and their households, experience direct or indirect benefits across various aspects of their lives, from livelihoods and income generation to food security, water resource management, and beyond. Activity **participants** in the Feed the Future context includes, but is not limited to, smallholder farmers, producer groups (crop and livestock cooperatives, outgrowers, etc.), micro, small, and medium enterprise owners (MSMEs) and employees, agro-dealers and input suppliers, and brokers and traders, among others. Digital interventions may be targeted toward any of these various participant types. The RFS Digital Strategy Action Plan recognizes the lack of digital inclusion, noting that many digital solutions are inaccessible, unaffordable, and not

[3] DigiFarm. 2021. Available online.
[4] McQuate, Mitch. Closing the global digital divide for universal gain, InterAction, 2023. Available online.
[5] International Telecommunications Union (ITU). 2002. Internet surge slows, leaving 2.7 billion people offline in 2022. Available online.
[6] International Telecommunications Union (ITU) and World Bank ICT Indicators Database, 2020. Available online.
[7] Opp, Robert. The evolving digital divide, UNDP Blog. Available online.

designed for the most vulnerable users.[8] Efforts this far have predominantly centered on enhancing device and internet access and addressing the gender digital divide–it's time for a more nuanced approach.

Digital inclusion isn't a straightforward positive concept. Digital inclusion is often portrayed as positive. This has fed a perspective that all inclusion is good, and all exclusion is bad and needs to be avoided. Yet, 100% inclusion is not realistic nor desirable because:

1. Some people may not want to be included due to potential risks.
2. Some people may experience negative repercussions and no longer want to be included.
3. Not everyone can benefit from the same digital interventions.
4. Not everyone can be reached. Achieving full inclusion is financially impractical; public investments may be needed to incentivize private sector actors.

Digital inclusion may also introduce new risks. For example, 'digital repression' reproduces repressive practices that exist in the physical world in digital systems. These practices often violate rights through surveillance, censorship, disinformation, etc.[9] and shift power dynamics, including intra-household dynamics and/or value chain actor relationships, affecting groups differently, initiating potential unintended consequences.

The 6 As of meaningful usage

Digital inclusion involves more than just access to devices and the internet, and more than just ensuring that women's access is equal compared to men. Digital inclusion encompasses equitable access, digital literacy, and offline benefits for all individuals, regardless of their background, social status, or achievements. The 5 'A's of Technology Access—availability, affordability, awareness, ability, and agency—reshaped the conventional view of access as either connected or unconnected.[10] Further improvements include shifting from a focus on access to meaningful usage that enables offline benefit.

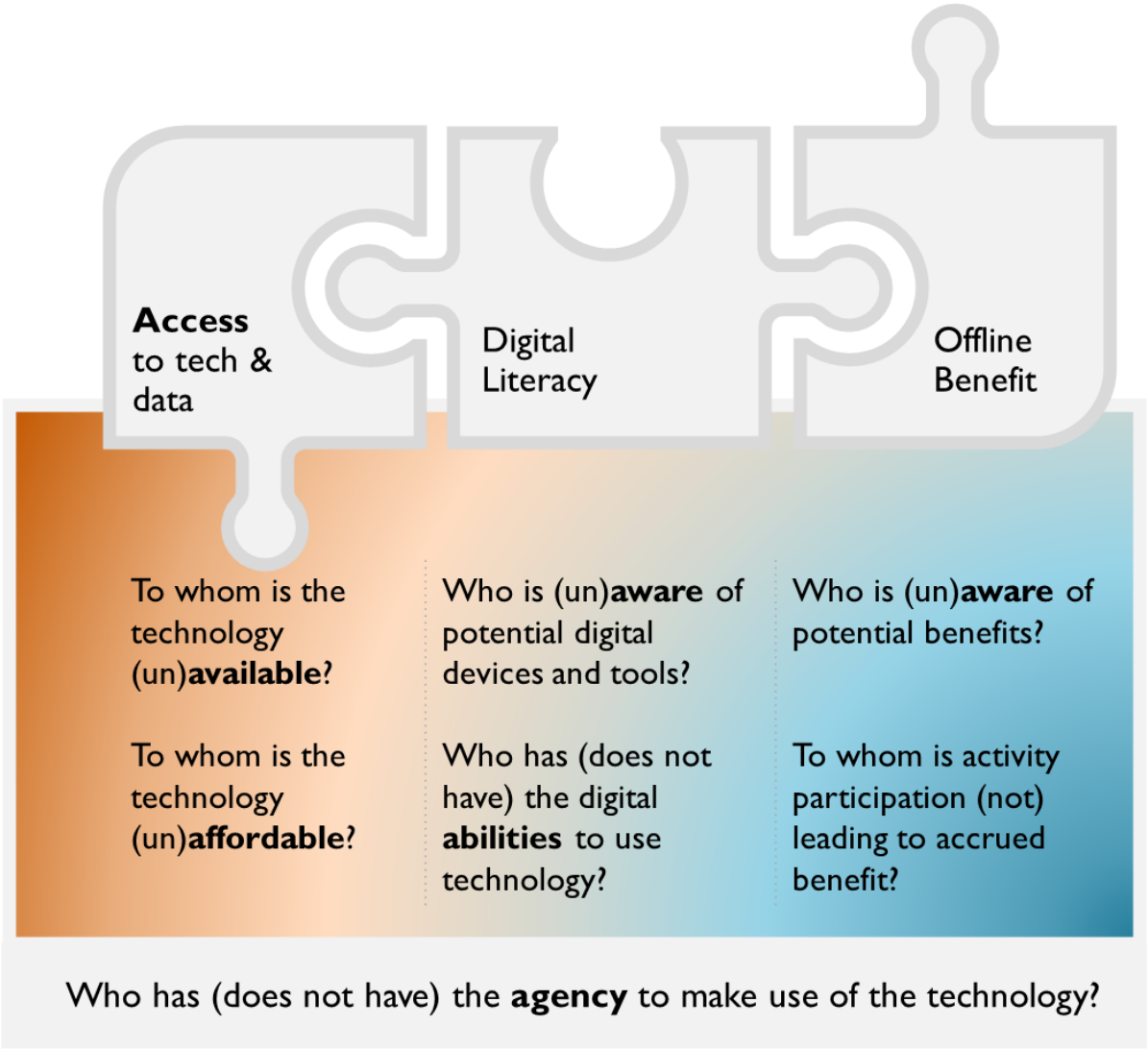
Building on this we go a step further in this toolkit: We add a sixth A–Accrual of benefits–which places a focus on the benefits experienced by activity participants. Figure 1.1 presents the 6 As as hands-on questions related to access, digital literacy, and offline benefits. Below the figure we elaborate each of the six terms.

[8] USAID Digital Strategy Action Plan. Updated 2021. Available online.

[9] USAID. Digital Ecosystem Framework, 2022, p.9. Available online.

[10] Authors' adaptation from Roberts and Hernandez, "Digital Access is not Binary: The 5'A's of Technology Access in the Philippines." 2019. Available online.

Figure 1.1: The 6 As of Meaningful Usage as Assessment Questions



Access: This divide focuses on the uneven availability of digital technologies and the internet. It highlights disparities in physical access to devices and internet infrastructure, particularly in rural, underserved areas. Bridging this divide involves expanding infrastructure and ensuring that everyone can connect. The case of the StaySafe.PH solution provides a good example of how in practice users' connectivity can drastically alter their digital experience (Case Study Box 1.1

Persisting disparities in access to digital technologies are observable across multiple dimensions, including gender, urban-rural divides, indigenous and non-indigenous populations, various age groups, people with and without disabilities. These access divides persist even as general national-level access to digital technologies increases. Therefore, access must focus on consistent use, decent bandwidth, and the purposeful realization of benefits, especially in areas like home, work, or education.

Case Study Box 1.1

Design Oversights and Digital Exclusion: The StaySafe.PH App's Challenges in Bridging Technology Access

Digital tools can be an effective mechanism to leverage when addressing challenges to public health and safety. Contact tracing emerged as a crucial tool to track and control the spread of the COVID-19 virus in the Philippines with the government endorsing the development of the StaySafe.PH app. The app aimed to provide citizens with a centralized and efficient platform to log their health conditions, trace contacts, and notify them of potential COVID-19 exposures.

The design process of the StaySafe.PH app was ineffective in assessing the social context and readiness of citizens in terms of their access, digital literacy, and ability to receive offline benefit, resulting in limited willingness to engage with the app. The Philippines still grapples with digital disparities including smartphone ownership and access to stable internet connection. Poorer digital literacy rates across older generations and rural or marginalized communities perpetuate discomfort accessing and using more advanced technological tools.

The smartphone ownership, internet access, digital literacy, and trust issues challenged universal adoption and effective utilization of the StaySafe.PH app, across the six As:

1. **Availability:** While the app was available on major app stores, the requirement of a smartphone hindered its widespread use. Many citizens still rely on basic mobile phones, rendering them unable to download or utilize the app.
2. **Affordability:** The app itself was free, but the data charges associated with downloading and using the app were prohibitive for some users.
3. **Awareness:** While the government promoted StaySafe as the official contact tracing platform, the level of public awareness about its functionalities and benefits was uneven. The varying efficacy of communication channels across regions and demographics meant that not everyone was equally made aware of the app and its benefits.
4. **Ability:** Digital literacy, and even general literacy, played a substantial role in the ineffective use of the app. Older generations and those unfamiliar with advanced digital tools often found it challenging to navigate the app or understand its notifications. The interface and user experience did not account for the broad spectrum of the Philippine population's digital proficiency.
5. **Agency:** Users had concerns about data privacy and how their personal and health information would be used. This apprehension was further exacerbated by a lack of transparent communication regarding data storage, usage, and sharing protocols. The perceived loss of agency over one's personal information deterred some from using the app.
6. **Accrual of Benefits**: Despite the adoption of Staysafe.PH as the official contact tracing app, insufficient efforts were made to tackle access barriers. Few attempts to address user and organizational concerns over data management lead to platform mistrust and limited benefits.

How can we assess access?

- **Availability**: *To whom is the technology (un)available?* Availability reveals disparities in network access and geographic disparities, emphasizing the historical context of infrastructure development. It can underscore the exclusion of women, minorities, and people with disabilities due to language and functional barriers.
- **Affordability:** *To whom is the technology (un)affordable?* Affordability shifts focus to economic constraints, highlighting how device costs and monthly internet or data packages costs can deter marginalized communities. For those with limited finances, maintaining devices and connectivity becomes a structural hurdle. Further, the presence of an electricity grid or solar panel infrastructure followed by the financial ability to access electricity cannot be assumed for many rural populations.

Digital Literacy: Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies and is the result of knowledge, skills, and awareness to use digital devices and services (capacity) and navigate potential harms and cyber threats successfully (safety).11 This dimension underscores the importance of ensuring that individuals, especially those in marginalized communities, possess the necessary skills to make productive use of digital technologies. Efforts must focus on enhancing digital literacy to empower people in leveraging these tools for personal and economic development, with attention to differentiating programs and solutions by individual producers, cooperatives, and intermediaries across resilience and food security stakeholders.12 Internet Saathi is a good example of a digital solution that successfully addressed the digital literacy challenge (Case Study Box 1.2

Digital literacy extends beyond basic skills and encompasses safety, security, privacy, cyberbullying, and ethics, and someone's capacity to prevent or respond to digital risks and hazards. Such skills are crucial for navigating the digital landscape safely and responsibly. This is particularly true for marginalized groups who may experience digital identity, tracking, and online interactions differently, and distrust digital solutions.[13] Furthermore, emerging challenges, such as technology-facilitated gender-based violence (TF GBV), underscore how intersections like gender, sexual identity, race, and age shape digital experiences.[14]

How can we assess digital literacy?

- **Abilities**: *Who has (does not have) the digital literacies to use the technology?* Abilities center on digital literacy and its unequal distribution among various groups. Often women, low-income populations, and the elderly face barriers due to limited resources, education, and exposure to technology. For example, nearly half of the people in rural Columbia, Ghana, Indonesia, and Uganda reported that they do not use the internet because they do not know how to use it.[15]
- **Awareness** (of tools): *Who is (un)aware of the technology?* Is the digital tool made available through channel(s) that are already known, used, and trusted by people? Awareness concerns knowledge about a technology's existence and possible uses. An intended user who does not know that a tool or service exists will not adopt it either. For example, projects focused on digital development that do not allocate enough resources for marketing and raising awareness frequently struggle to scale.

[11] USAID, DAI Digital Frontiers. Digital Literacy Primer: How to Build Digital Literacy into USAID Programming. 2022. Available online.
[12] USAID. Digital Literacy: Agriculture and Food Security. 2023. Available online.
[13] Plan International. State of the World's Girls 2020: Free to be online? Available online.
[14] TF GBV Landscape. USAID Findings for East Asia Region. NORC at the University of Chicago and the International Center for Research on Women (ICRW). Landscape Analysis of Technology-Facilitated Gender-Based Violence: Findings from Asia. 2022. Available online.
[15] Alliance for Affordable Internet. Meaningful Connectivity for Rural Communities, 2002. Available online.

Case Study Box 1.2

Internet Saathi: A Community Based Solution Addressing Digital Literacy Divides

The Tata Trust's Internet Saathi program is dedicated to enhancing digital literacy in rural India by employing a network of digitally trained women to share knowledge within their communities. Despite India having the world's second-largest online population, with over 500 million internet users, only 30 percent are women.[16] This divide is particularly pronounced among women in rural populations, often leading to their exclusion from the benefits of digital solutions. Even with the introduction of user-friendly interfaces and step-by-step training, societal and behavioral barriers continue to impede communities from fully engaging with digital resources. Internet Saathi endeavors to dismantle these obstacles by training women and supporting them in promoting digital literacy within their rural communities.

What are their pre-existing abilities to access, engage and benefit from the digital solution?

Internet Saathi's effectiveness in addressing digital skill gaps stems from its community engagement model, which is grounded in established community and knowledge sharing practices. Google and Tata Trusts initially conducted a series of pilot projects aimed at discerning the most effective approach to enhancing digital literacy among rural women nationwide. Initially, professional external trainers were employed, but only a limited number of participants actively engaged in the program. Given this initial setback, the pilot pivoted to the Internet Saathi program which was designed around local women trainers. After completing their training, these women become 'Saathis', the Hindi term for 'friend', and are assigned to their own and three neighboring villages. Carrying smart devices, the Saathis educate women about the advantages of the internet and how to integrate it into their daily lives. Only when rural women themselves started serving as trainers did the initiative see increases in active participant numbers.

In what ways does the project successfully address digital literacy challenges and divides?

The Internet Saathi model has had a profound impact, with Saathis serving as catalysts for the initiative's rapid expansion and transformative benefits. Since its launch three years ago, Internet Saathi has reached over 15 million women through the efforts of 48,000 Saathis operating in 150,000 villages. Over 80 percent of women who participated in Saathis' training reported a greater understanding of the internet. Additionally, 25 percent of respondents indicated that they now use the internet an average of five times per week. Further, one-third believed that their economic well-being had improved due to gaining new internet-based skills. These outcomes illustrate the success of leveraging a trusted local and female voice.

[16] The Bridgespan Group. 2021. *Empowering Rural Women Through Digital Literacy: Internet Saathi*. Available online.

Accrual of offline Benefit: This dimension emphasizes the need for tangible benefits from digital engagement. It acknowledges that digital inclusion should lead to meaningful offline improvements in various aspects of life, such as livelihoods, income generation, food security, and resource management. This requires that digital initiatives yield concrete, positive impacts for all individuals, irrespective of their backgrounds.

An offline benefit may also set off a ripple effect: For example, someone who is able to translate internet use to an economic gain, may use these extra financial resources to purchase more advanced digital hardware or software, which allow this person to gain more social status and connections, and become more and more digitally included. Consequently, disparities can rapidly accumulate between users who can and cannot leverage their technology use and digital skills to yield favorable offline outcomes. This also implies that individuals with similar levels of digital abilities and access in the digital realm do not necessarily reap the same offline benefits.

How can we assess offline benefits?

- **Awareness** (of benefits): *Who is (un)aware of the potential benefits of the technology?* Here, awareness concerns knowledge about a technology's and relevance to one's life. Without an understanding of the potential benefits of digital tools, participants will not be motivated to adopt them. Projects need to reserve resources to raise such awareness or they risk that a good digital solution does not reach or appeal to a large user base and fails to have impact at scale.
- **Accrual of benefits**: *To which participants is activity participation (not) leading to accrued benefit?* Focusing on accrued benefit reveals how existing inequalities may disrupt benefit accrual for some participants but not for others. Consistent and rapid analysis of benefit accrual, followed by iterative questioning of "why", is likely to reveal socio economic inequalities. These inequalities may need to be better incorporated into activity programming to ensure that digital tools remove and not exacerbate inequalities. The Kasha case below provides a good example of a digital service committed to ensuring diverse women experience offline benefits through use (Case Study Box 1.3)

Case Study Box 1.3

Addressing Access Divides Through Offline Solutions: Fairfood's Success in Making the Indonesian Nutmeg Supply More Transparent

Fairfood and Verstegen have developed a suite of digital tools to connect smallholder nutmeg farmers in Indonesia to supply chains, improve business practices, and enhance farmers' income. In Indonesia, nutmeg is primarily produced by smallholder farmers, who are often left disadvantaged within the supply chain due to digital infrastructure constraints. Many nutmeg farmers do not own a phone and are typically older in age; with the average age across Indonesia's two largest nutmeg producing provinces being 53.[17] Given the older demographic, farmers can often lack familiarity with technology. Without access to digital devices, smallholder farmers are unable to access critical information on market prices, farming practices, or knowledge on how to identify the type of nutmeg grade they are taking to market. Additionally, smallholder farmers do not understand how their data is being used across the supply chain nor do they have a digital ledger to track their data.

These constraints, alongside recent EU regulations to improve the traceability and quality of imported nutmeg from Indonesia, motivated Fairfood to partner with Verstegen, a spices company, to roll out their 'Trace'

[17] Tienni Irham et al. 2020. *Comparative and competitive advantages of nutmeg farming in two regions in Maluku Province, Indonesia.* (Biodiversitas. Volume 21, Number 3). Available online.

Addressing Access Divides Through Offline Solutions: Fairfood's Success in Making the Indonesian Nutmeg Supply More Transparent

platform.[18] Trace is a blockchain-powered platform developed by Fairfood that facilitates payments between farmers and wholesalers and records crucial data like, in this case, nutmeg type, quality grade, and base price paid to the farmer. The platform also verifies if farmers have received the quality premiums to which they are entitled. Through tracking farmer data on Trace, the ground nutmeg jars that Verstegen sells to customers in the Netherlands all have a QR code which consumers can scan to trace their nutmeg back to the farmers, enabling transparency across the nutmeg supply chain.

What are their pre-existing abilities to access, engage and benefit from the digital solution?

Fairfood initiated a pilot program in North Sulawesi with a focus on digitizing farmer data, while taking into account limited mobile and smartphone access. In Indonesia, only 56% of people own a mobile phone and there is a notable urban-rural internet connectivity divide, with 62% of urban adults being connected compared to 36% in rural areas, where the majority of smallholder farmers reside.[19] These connectivity challenges posed obstacles to rolling out the Trace mobile app, with many smallholder farmers' mobile devices not supporting the functionality required to engage with the app. To overcome this, Fairfood introduced farmer cards, which utilize near-field communication (NFC). NFC is similar to the technology that powers tap-and-go debit cards. When a farmer conducts a transaction with a wholesaler, they simply tap their unique farmer card on a mobile device that wholesalers who have partnered with Verstegen are provided, and use to operate the Trace app. The wholesaler then records key information such as quality grade, base price, and nutmeg weight on the Trace mobile app. The farmer confirms the accuracy of this data and receipt of payment. This transaction is then logged on the Trace platform, with the details linked to farmers' unique digital profiles created when issued a farmer card. This allows farmers to engage with the Trace app even in areas with limited internet access. In instances where the card is forgotten, a paper receipt is provided, photographed by the collector, and attached to the transaction for record-keeping.

In what ways did addressing access barriers lead to meaningful engagement?

Fairfood and Verstegen adopted a farmer-centric approach to data management, aiming to not only provide access to data but also facilitate meaningful engagement with it. Fairfood's aim is to empower farmers with control, ownership, and the ability to earn from their farm data. With this in mind, Fairfood and Verstegen have introduced a data premium alongside a quality premium, allowing farmers to economically benefit from the sharing of their data. Smallholder farmers who choose to participate in the pilot are oriented on how their data will be recorded and used, and once their explicit consent is provided, they are paid a data premium per kg Nutmeg collected for Verstegen for their engagement. The introduction of the app and farmer cards has resulted in a 4% increase in income for nutmeg farmers, attributed to the data and quality premiums.[20]

Further, each farmer card has a QR code, which farmers can use to access their transaction data. Smallholder farmers can do so by scanning the QR code on a mobile device or sending an SMS or WhatsApp message using

[18] Centre for the Promotion of Imports from developing countries - Ministry of Foreign Affairs. 2018. *Exporting nutmeg to Europe.* Available online.
[19] The World Bank. 2021. *Ensuring a More Inclusive Future for Indonesia through Digital Technologies.* Available online.
[20] USAID. 2023. *Enabling Farmers within a Farmer-centric Supply Chain and Premiums.* Available online.

Addressing Access Divides Through Offline Solutions: Fairfood's Success in Making the Indonesian Nutmeg Supply More Transparent

their unique card ID to access their unique digital ledger. If they are unable to access a mobile device that has WhatsApp capabilities, Fairfood also facilitates the printing of transaction records for smallholder farmers at co-ops or trade centers through bluetooth-enabled printers. However, Fairfood found that once smallholder farmers recognized the value in their transaction data, they were more inclined to find ways to access a smartphone within their social networks, such as borrowing from a family member or neighbor. These digital transaction ledgers serve as proof of regular income for smallholder farmers, assisting them in obtaining formal credit, which is a continuous challenge for smallholder farmers, given their limited access to digital finance platforms and bank accounts.

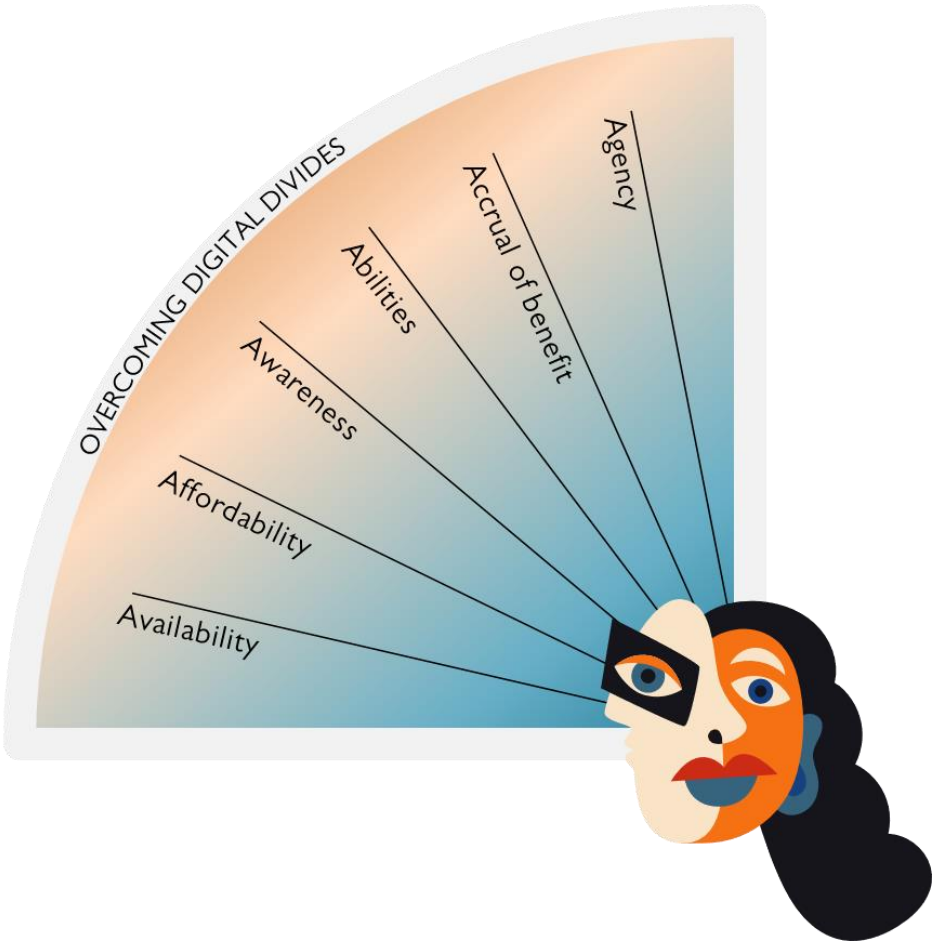
Agency is the foundation to overcoming all three digital divides: This dimension highlights the importance of the individual, their attitudes toward technology, their aspirations for how they use it today as well as their future uses, and their self-efficacy and belief in one's own ability to use technology effectively.[21]

- **Agency:** *Who has the self-efficacy to make use of the technology?* Agency forms a substantial barrier, particularly among marginalized individuals who may perceive accessibility and affordability but lack the confidence to adopt a digital solution with the aim of bringing about change in their personal life. Others, such as urban, educated, young men may feel comfortable experimenting with new technology. Special programming, which focuses on understanding and potentially changing social norms, may be needed to engage such excluded populations. Furthermore, stake, in the sense of a person's agency to take decisions and be in the driver seat belongs here too. For example, can someone determine how and by whom their data is used, or how a digital tool is governed?

Together, the 6 As of meaningful usage outline a person's digital journey to overcoming digital divides (Figure 1.3 below). In the overcoming Digital Divides section of Figure 1.2., each A that makes up meaningful usage is outlined, acknowledging that users may be in different positions for each of the 6 As, and thus have more or less of each A. When users experience more agency, availability, affordability, abilities, awareness, and accrual of benefit, they are more likely to have overcome digital divides.

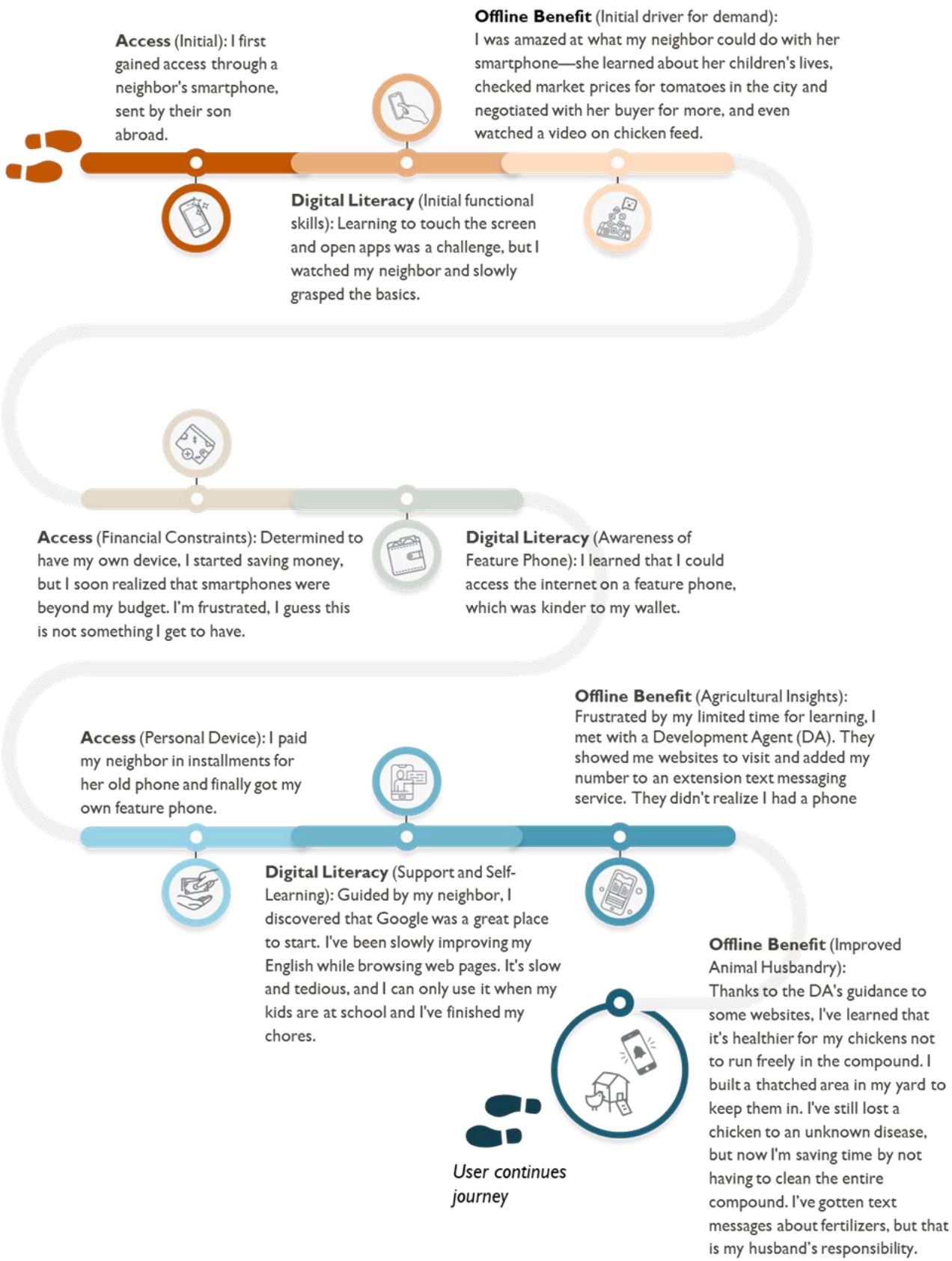
[21] Woodard, Josh. 2019. The Seven A Checklist to Design with the User in Digital Development. ICTWorks. Available online.

Figure 1.2: The 6As of meaningful usage that reflect a person's digital journey to overcoming digital divides.



User Digital Journey for a Smallholder Woman Farmer: The interlinked nature of digital divides
Addressing the three digital divides, access, digital literacy, and offline benefits, is not sequential. It requires a systematic and interlinked process in which progress in one dimension buttresses progress in another. Achieving digital inclusion depends on addressing social factors like awareness and agency and accommodating for user capacities such as affordability and ability. It also requires a technological solution to be available and accessible for many diverse user groups, including those who are often marginalized, or living in countries and/or communities that are difficult to access. If you look at the figure below you will see one person's possible journey to overcome digital divides and become digitally included.

Figure 1.3: Sample User Digital Journey to Overcome Digital Divides



This journey highlights the intertwined nature of digital access, literacy, and offline benefits, demonstrating how relatively disadvantaged people must have resilience and determination in overcoming barriers to access, engage, and benefit from digital resources. Now let's apply this knowledge to your own personal experiences in our first activity.

Activity 1.1

How have you overcome digital divides?

You likely have overcome all three digital divides, but have you ever thought about how this happened? Now that we've demonstrated how access, digital literacy, and offline benefits reinforce and support one another. In this activity you will break down how this occurred in your own life by answering the following questions:

- What was your very first interaction with a mobile phone or a computer? Consider how that came to be, how you became aware of the tech, what potential benefits were clear to you, and if relevant, who paid for or subsidized your access.
- How were you able to build your comfort with the phone/computer? Consider if someone else provided for you in any way for you to have the time to build your comfort, to practice, and to gain fluency.
- Did you experience any language barriers on the internet? If yes, how did this affect your use of the internet?
- What was the first benefit you received from using the internet? Consider social, financial, education, and/or recreational benefits.
- Today, what are the ongoing benefits you receive from digital engagement? In what areas do you continue to learn (strengthen digital literacy) to keep up with technological advances?

Intersectionality Lens: Seeing how existing inequalities change opportunities

Intersectionality refers to how people's multiple characteristics shape their experiences and how others treat them. Intersectionality demonstrates how discrimination, such as racism, sexism, homophobia, and others, create patterns that impact people's everyday opportunities. Some traits, like race, age, and sex, are generally unchangeable, while others, such as income and language, can potentially be altered. These characteristics intersect and impact how individuals can navigate inequalities and opportunities. Often these characteristics play out in people's lives by compounding advantages or disadvantages.

In Figure 1.4. you will see different dimensions of intersectionality–check out the Glossary for a refresher on these terms. The importance of these dimensions varies within and between cultures. Additionally, there may be dimensions that are not listed here but that are relevant in some local contexts. The question marks serve as proxies for those missing dimensions.

Figure 1.4: Dimensions of Intersectionality

Activity 1.2

What's your intersectional identity?

Now that we've reviewed intersectionality, let's apply it to your own life and opportunities or challenges by answering the following questions:

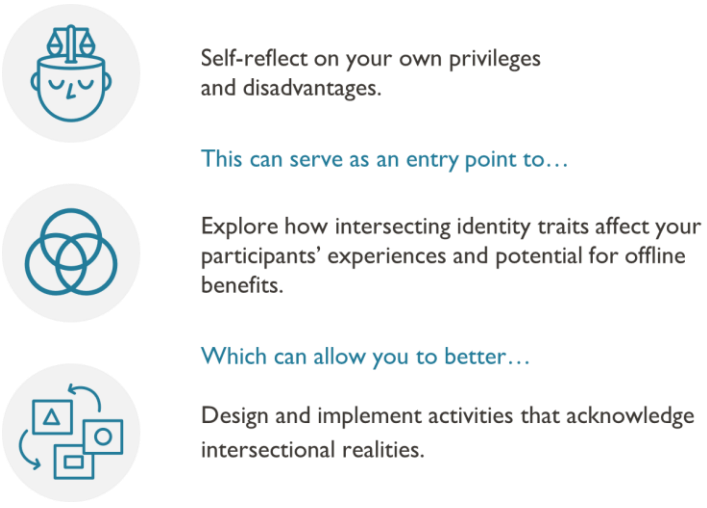
- Are there any dimensions missing from the figure (e.g., gender, age, sexuality, indigeneity, education, etc.) that are relevant to your intersectional identity? Please add them. Don't forget to use the glossary as a resource to consider which dimensions apply to you.
- Along each dimension, where do you place yourself in terms of privilege or marginalization? For example, in many societies, men are considered to have more privileges than women.
- Reflecting on your life experiences, which *combinations* of dimensions have had the most impact on altering your opportunities, either positively, negatively, or both? For example, in important work settings, a person might gain more notice if they are white, American, and have an advanced degree. If any of those dimensions had been different, people might not take their thoughts as seriously.

Why does intersectionality matter?

At an individual level, intersectionality influences daily experiences and engagement in development activities. For example, young women may require different off-farm programs than young men due to social norms in their community around mobility. Similarly, older women might need user interfaces that are more image-based, or services based on interactive voice response (IVR) to accommodate for lower literacy. For some participant groups, who are looking to fund agricultural inputs, interest-based loan programs may not align with their religion.

More broadly, discrimination and oppression can determine individual or groups of people's opportunities over time and can perpetuate inequality. Intersectional thinking helps to uncover, explore, and address the root causes of inequalities. It prompts you, as a practitioner, to consider participants' unique needs and the social norms and realities that must be addressed for equitable participation. Have a look at the example of DigiFarm in Case Study Box 1.4. where it turned out that gender was not the only dimension that caused lower uptake of the platform by women.

By using intersectionality you are better equipped to:



Case Study Box 1.4

Highlighting Intersectional Identities and User Engagement Trends: DigiFarm Segmented User Analysis

Segmented user research conducted by DigiFarm in collaboration with Mercy Corps found that the intersection of socio-economic characteristics deeply affect usage patterns amongst women users. DigiFarm is Safaricom's integrated mobile platform of digital services for producers, enabling users to access key products and services. Data showed that only 34% of registered DigiFarm users were women. To create an engagement strategy, a segmented user engagement analysis was conducted.[22] Analysis focused on women users' engagement journeys from awareness and onboarding to product use and advancement. Digital usage patterns were then tracked across socio economic characteristics such as: age, location, marital status, education, digital literacy, livelihoods, and household context. Findings highlighted a clear connection between socio economic characteristics and user comfortability on the platform. In turn, three profiles of women users were highlighted, from super to average to low users.

The segmented women user groups highlight how social dimensions intertwine and provide concrete examples of how overlapping identities shape individual experiences of technology.

Super User: Primarily married women residing in peri-urban areas. They often hold the highest level of education and are consequently active users of DigiFarm. These individuals show a strong interest in technology and frequently use different online platforms to learn about new digital tools and services.

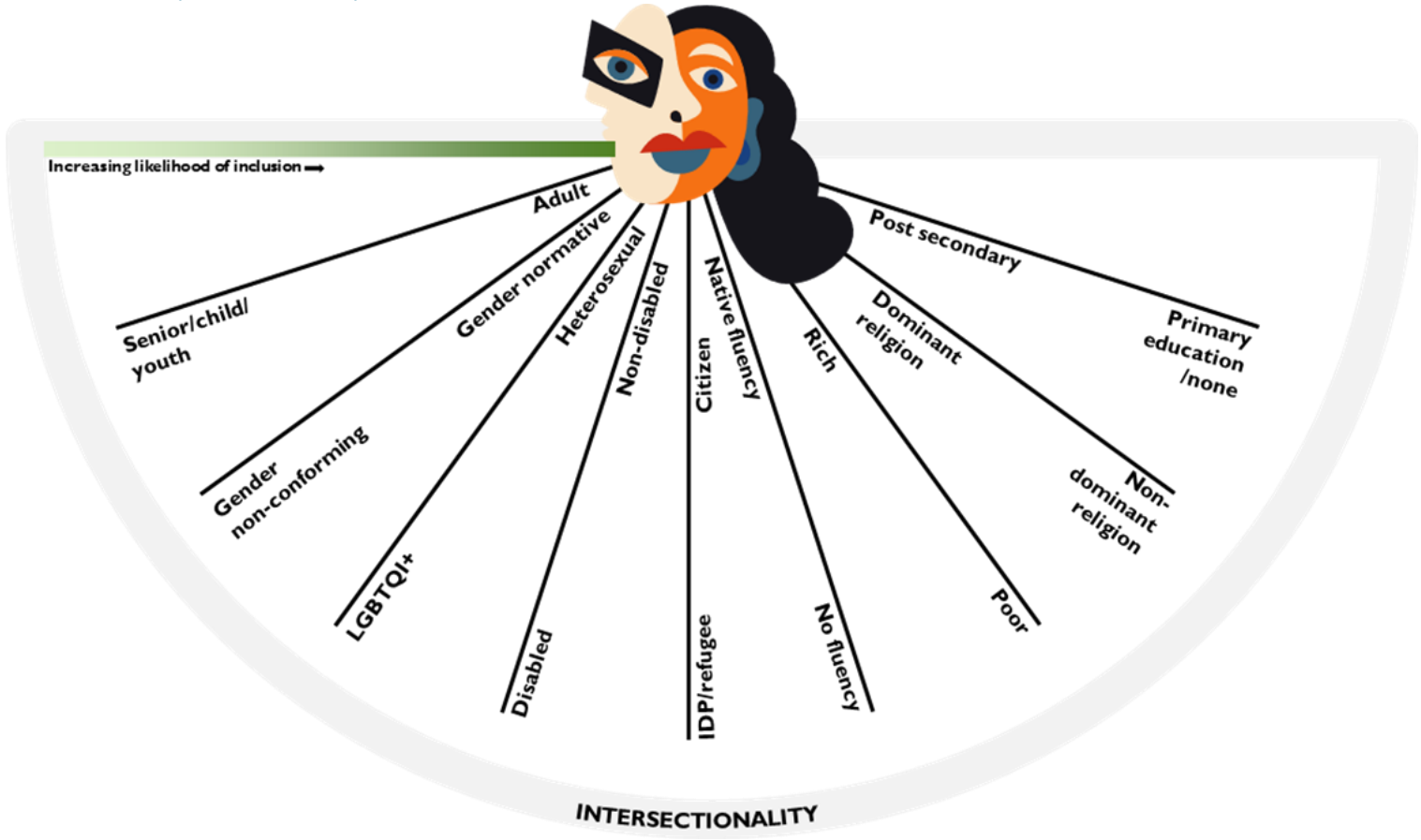
Average User: Majority live in peri-urban or rural regions and their highest educational attainment is typically high school level. They possess a moderate level of digital proficiency and form the standard user demographic of DigiFarm. Women in this category often utilize a portion of their husband's land for farming.

Low User: Often middle-aged and older women in rural areas, with primary education as their highest attainment. They possess limited digital proficiency and represent the segment with the lowest engagement in DigiFarm. They often have lower involvement in household decision-making, frequently depending on their partners' approval for financial and farming matters.

[22] DigiFarm. 2021. *Gender Impact Study: Final Consolidated Report*. Available online.

Intersectional experiences determine people's ability to capitalize on opportunities, overcome challenges, and avoid harmful circumstances. In this way, intersectional experiences influence how, for example, educational and economic opportunities play out. Intersectional experiences also influence digital inclusion: Privilege, from an intersectional perspective, often manifests as a likelihood that a person will be able to capitalize on opportunities. Vice versa, marginalization often manifests as a likelihood that a person will be unable to capitalize on opportunities and thus be excluded. However, these likelihoods are generally not caused by a single dimension but result from the interplay between many dimensions. Have a look at the figure below. Here you'll find three categories–likely included, potentially included, and likely excluded–which may overlap with a person's unique constellation of intersectional experiences. Curious to know more about your own likelihood of inclusion? Move to Activity 1.3. to find out.

Figure 1.5: Likelihood of Inclusion by Intersectional Identity



Activity 1.3

How does your intersectional identity influence your opportunities?

Consider how intersectionality has influenced your life opportunities, or lack thereof. Have you ever had an interaction with another person where they treated you based on how they perceive your gender, race, social class, etc.? Pause and reflect on how your intersectional identity has influenced your life pathway over time.

- Can you recall a time in your life when you received a positive benefit because of how someone else perceived and treated you? For example, *"men perceive me as a single woman and often pay for things, meaning that I get to save my money for other things."*
  - ❖ Do you believe that you would be perceived or treated the same if you held different positions on the same or other intersectional dimensions?

- Can you remember a time in your life when you were denied an opportunity or access, or experienced physical or emotional harm because of how someone else perceived and treated you? For example, *"people struggle to know what pronoun to use for me because I dress in androgynous clothing and styling, so I think they just avoid talking to me or about me."*
  - ❖ Do you think that you would be perceived or treated the same if you held different positions on the same or other intersectional dimensions?

- Along each dimension, where do you place yourself in terms of privilege or marginalization? For example, in many societies, men are considered to have more privilege than women.
  Mark your position for each intersectional dimension on the arrows of the wheel

  Hint: Closer to the center = more privileged, closer to the outer border = more marginalized.

- Now let's zoom in on your digital journey: How do you think that your intersectional identity has influenced your digital journey? In what ways do your intersectional identity, and the socioeconomic resources you hold, affect your access, digital literacy, and experience of offline benefits? For example, *"since my grandfather was part of the colonial government and settled in this country, my family acquired resources and my parents grew up with phones and therefore gave me one as a child. Now I'm a proficient user and I easily saved money to buy a smartphone."*
  - ❖ How do you imagine that this digital journey might be different for other intersectional identities?

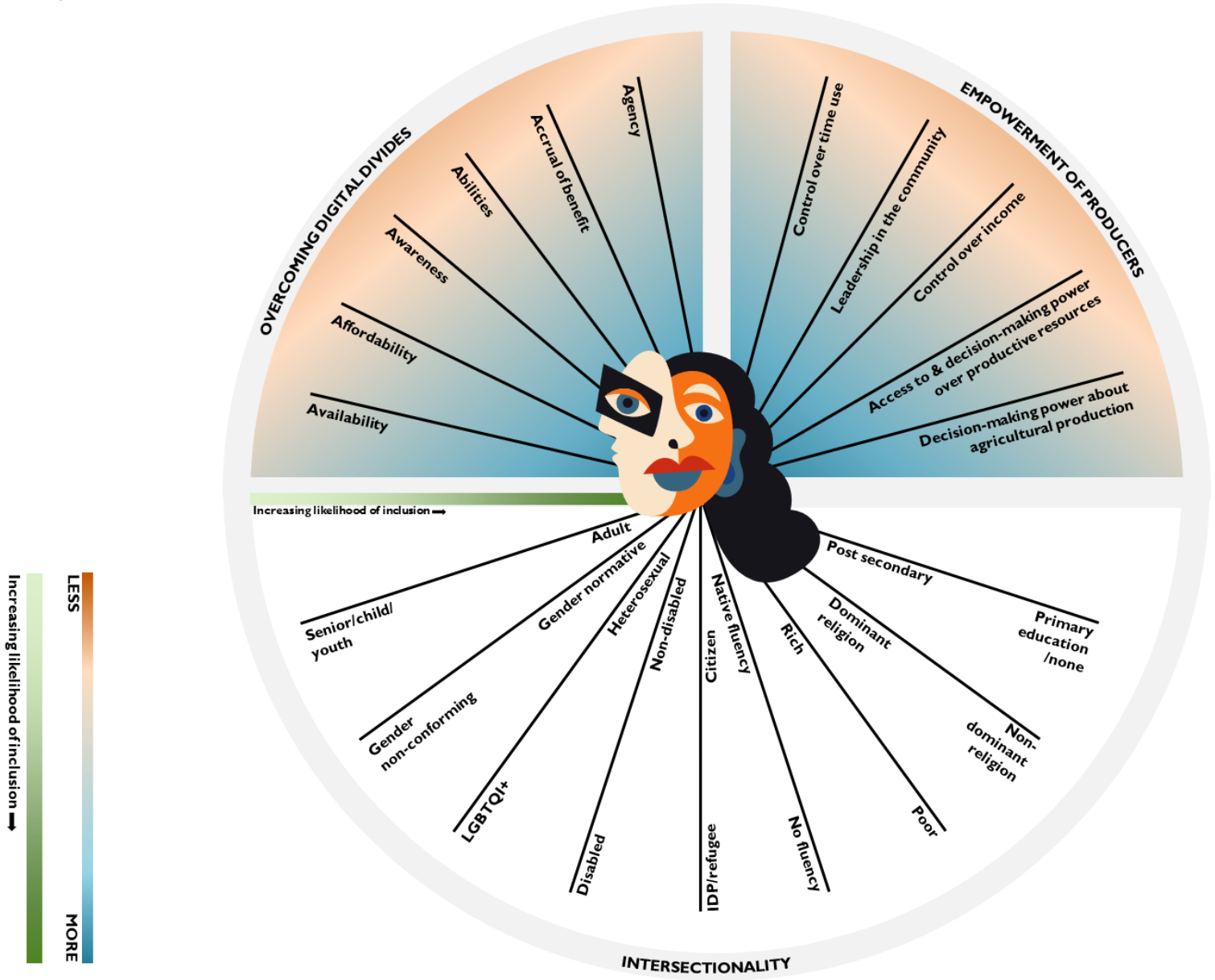
Digital Inclusion within Feed the Future activities

Envisioning the complexities of a single individual and how they are, or are not, able to leverage opportunities to advance their livelihood is difficult. The following Inclusion Wheel (Figure 1.) is a conceptual tool to gain entry into three core areas that will influence a person's ability to participate in and benefit from participation in an FTF activity with a digital intervention. The wheel can help you understand if a participant in your FTF activity is likely to be included, potentially included, or likely excluded.

A person's intersectional identity is only one piece of their opportunity puzzle. In addition to their intersectional identity, their journey to overcome digital divides and empowerment as a producer also influence how likely they are to become included in digital interventions within FTF activities. People's ability to capitalize on their

participation in an activity also depends on these existing circumstances. Assessing participants' starting point is thus key to increasing digital inclusion through programming. The Inclusion Wheel, in Figure 1.6, charts the three areas as factors affecting the likelihood of inclusion in digital initiatives.

Figure 1.6: The FtF Digital Inclusion Wheel



- On the top left of the wheel, each person will likely have a different starting point with respect to their journey overcoming digital divides. This influences their ability to engage with the digital solution and programming that may be offered by an Activity.
- On the top right of the wheel, each person is likely to be in a different position regarding their empowerment as a producer, and within a household.[23] Please keep in mind that these categories are predominantly for individual producers and may need to be adjusted for other resilience and food security participants.
- Intersectionality is represented as the bottom half of the wheel. The unique constellation of each person is presented as a complex interaction between the different dimensions of their identity. This influences how they are perceived and treated by others. As we already mentioned: each dimension and its labels should be understood as culturally situated and as a reader you are welcome to adjust the dimensions and labels for your cultural context.

Each person is a unique constellation of these three areas. The interactions between a person's existing status in these three areas will determine how likely it is that this person is included and can benefit from digital activities. Privilege in one dimension may enable someone to overcome challenges in another. Alternatively, marginalization in one dimension may limit a person's ability to reap benefits from privilege in another dimension.

Activity 1.4

Defining your own likelihood of digital inclusion

If you had an opportunity to join an initiative about using a new (digital) tech product, would you be able to (re)organize your life to take advantage of the opportunity? Consider how your existing digital journey of the 6 As and how your empowerment as a producer (or potentially for you, it might be as a wage earner) enables you (or not) to take advantage of new opportunities by answering the following questions:

- Fill out the Inclusion Wheel for yourself, this time considering the digital divide and empowerment of participants (as best as you can, adapt for your context). Draw a circle around or shade in where you place yourself in each dimension, assessing how your varying locations create your likelihood of inclusion.
- Taking a broad view of your many different positions (some privileged, others marginalized), are you likely to be included, potentially included, or excluded from a digital initiative? Why and how did that come to be in your life?
- How might this be different for the participants that you have worked with over your career?

Bringing intersectionality into user personas

We've identified that the likeliness of inclusion is not equal for all participants in a digital FTF activity. Now, let's apply this perspective to assessing digital inclusion through user personas.

Below we share 5 user personas representing individuals in rural settings, such as smallholder farmers, pastoralists, and agribusiness owners, and highlight their intersectional identities, their relative empowerment as producers, and their existing digital literacy. These are based on TechnoServe's five personas, which vary by literacy, access to tech devices, and internet access.[24] Want to learn more about leveraging user personas in action? Jump to a case study on TechnoServe.

[23] This is adapted from the Women's Empowerment in Agriculture Index (WEIA) and is meant as a conceptual tool, not a measurement tool. International Food and Policy Research Institute (IFPRI). Women's Empowerment in Agriculture. Available online.

[24] Hale, David. Tech vs. Poverty: How to Create Better Solutions for the Right End User. 2021. Available online.

Figure 1.7: User Personas

User Persona 4 – Beth

Beth is a 23-year-old woman who runs a successful agricultural inputs store in her town. Growing up in town meant that Beth was supported by her family to complete high school and reads and writes both her mother tongue and English very well. Beth comes from a conservative religious family and community, and they have been very skeptical of how young people are using technology, saying that it is disrupting their morals. Beth uses her smartphone for two key reasons. First, for connecting with suppliers and checking market prices as well as learning about new fertilizers and seed offerings. Second, she suspects that she is queer and does not feel comfortable talking with anyone in her community about it. Many people borrow her smartphone, and she is very concerned that they will somehow find out that she is "different." She knows she would be ostracized from her community, even though she has built a successful business here.

User Persona 3 - Ahmed

Ahmed is a 28-year-old literate landowner. Ahmed is part of the majority ethnic group who settled in the area long ago and his family owns a large parcel of land. Ahmed had polio as a child and is unable to walk easily, so his father gifted him part of their land to rent to tenant farmers. A few years ago, a family member sent him a smartphone from abroad. Being part of a cooperative, he sought guidance from the cooperative leader and learned smartphone functionalities over several afternoons while his wife made coffee. This newfound knowledge led him to discover mobile banking apps, saving him time from traveling to the bank, which is difficult for him. Sharing his new experiences with the smartphone, he connected with others in his community and became part of a farmer risk reduction initiative, supported by government deposits into his bank account. Despite not fully grasping the reasons behind it, Ahmed receives direct payments into his bank account when it does not rain much.

User Persona 2 – Makdi

Makdi, a 45-year-old literate small business owner, operates a successful dairy business in her rural community. Raised in rural poverty, her education was cut short because of safety concerns that she would be abducted for marriage on her way to school. After working as a domestic servant in the Middle East for seven years, she saved enough to start her own dairy farm. She reads and writes but it is challenging and takes her a long time, which she has plenty of since she is unmarried and has no children. Today, she manages 60 cows in her dairy business and uses her smartphone extensively. She participates in a Telegram group for dairy farmers, watches YouTube for farming insights, and coordinates feed orders. Recently, Makdi's business suffered because neighbors, after seeing her talk on her phone and then seeing a man arrive and go into her house, led to unfounded rumors in her neighborhood, negatively affecting her dairy sales.

User Persona 1 - Elena

Elena is a 50-year-old illiterate indigenous smallholder farmer in a remote village. She not only manages her farm but cooks all meals for her three children. She's part of a women's coffee collective, which is rare in this historically male-dominated industry. While her cooperative leader uses a smartphone for Facebook, Elena struggles with her feature phone. She seeks ways to enhance coffee quality, noticing male collectives receiving better prices. When she enquires about how this is achieved, they ridicule her, telling her she will not succeed as a woman and that coffee is not her business.

User Persona 0 - Tuki

Tuki, a 45-year-old man living in a remote village. He is illiterate, from a low caste, and has no access to technology. His remote location further compounds his marginalization, as he faces limited opportunities for education and economic advancement. There is no paved road within 50 miles and no one in his community owns a phone. Only the children who have left the village have phones and when they visit, they say the phones do not work. Tuki, along with the other men in the village, listens to football matches and music on the radio. He notices that his wife and her friends prefer to sing while they harvest or process crops and is surprised they aren't interested in hearing music.

Activity 1.5

Analyzing users from an intersectional and inclusion perspective

Carefully read the five user personas above.

- In each persona, what are the different dimensions of intersectionality that are at play?
- In each persona, what is the role of social norms?
- Across all personas, which users demonstrate agency?
- Across all personas, which users face digital literacy challenges?
- Across all personas, which user's digital inclusion is exacerbating inequalities?
- If you were to run an FTF activity with a digital intervention, who is most likely to be included without additional assistance? Who is potentially included and what might you need to do to include them? Who is likely excluded and what might you need to do to reach them?

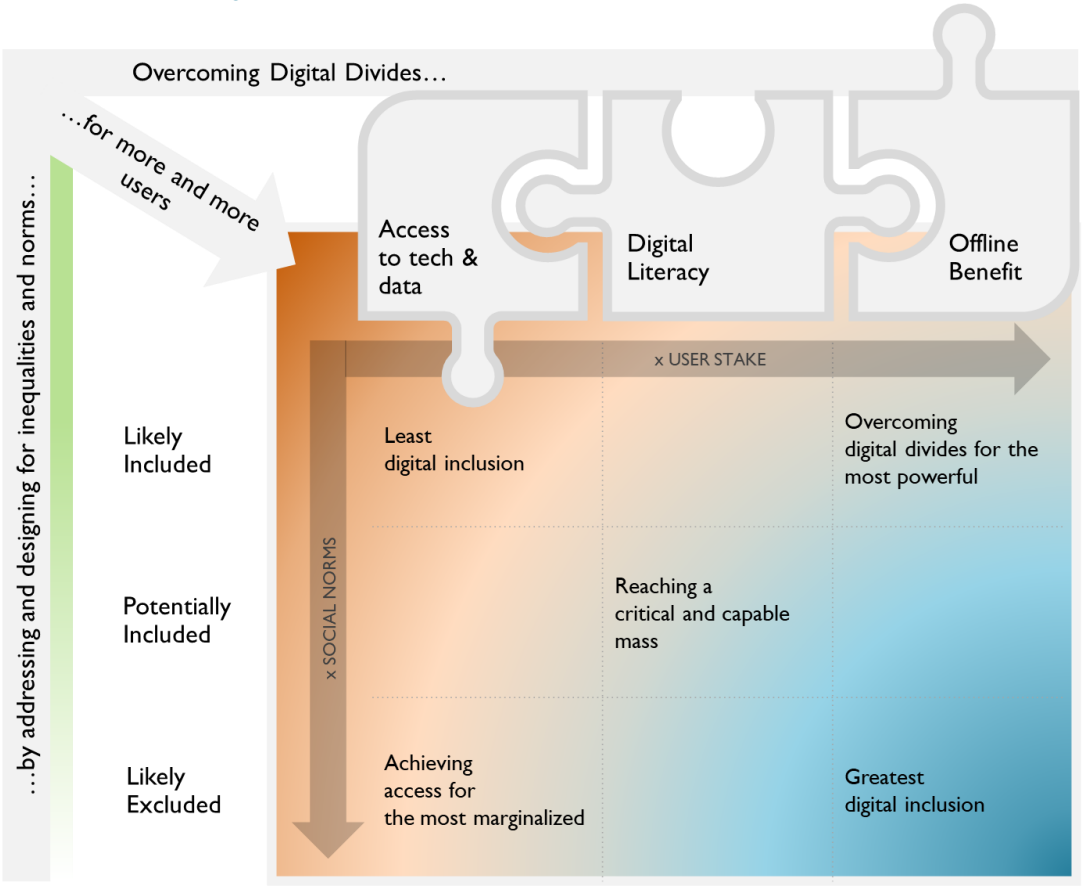
The Intersectional Digital Inclusion Framework

In the first section, we elaborated that access is more than simply being connected or unconnected, and highlighted the interlinked nature of access, digital literacy, and offline benefit. We also provided the 6 A's of meaningful usage as a way to assess inclusion with respect to the three digital divides. In the second section, we challenged you to look beyond gender as a key dimension to separate social groups. We demonstrated the importance of intersectionality and provided tools to assess how likely someone is to be included in a digital FTF activity. Now let's put the building blocks from the first two sections together into a framework!

Have a look at the figure below. This Framework combines three key objectives:
1. Overcome all three interlinked digital divides

2. Design Activity programming and digital solutions to mitigate existing inequalities and norms
3. Do the above for more and more users.

Figure 1.8 The Intersectional Digital Inclusion Framework



Overcome all three interlinked digital divides

Instead of viewing these divides as sequential, it is important to remember that progress in one area is likely to help reinforce progress in another. Becoming aware of potential benefits can help drive a reallocation of household savings to buy a phone, which then offers an opportunity for someone to practice and improve their digital literacy. These journeys are not linear.

Design programming and digital solutions to mitigate existing inequalities and norms

By using an intersectionality lens, we gain entry into the different programming and solutions that might be required to meet the diverse needs of different potential user groups. The ability to be included in digital initiatives is dependent upon numerous interconnected areas: intersectional identity, journey to overcome digital divides, and empowerment as a producer. In each cultural and community context, individuals likely map onto a continuum of relative advantage, disadvantage, and marginalization in relation to one other.

The three likelihood categories represent a continuum of likely inclusion or exclusion in a digital initiative. For example, individuals who are advantaged in relation to others in their communities (typified by User Persona 4 in Figure 1.7) are most **likely included**. Individuals who are relatively disadvantaged when compared to those who are advantaged (typified by User Persona 2 in Figure 1.7) are **potentially included**. And individuals who are relatively marginalized (typified by User Persona 0 in Figure 1.7) are most **likely excluded**.

How to reach more and more users

The goal of any development activity is to scale positive benefits to more participants, creating systems-level change. This is no different for digital interventions.

The Framework (Figure 1.7: User Personas), to this end, helps highlight that any step to the right and/or down in the digital inclusion framework is an advancement in terms of digital inclusion. Your goal should not be to achieve the bottom right cell of "greatest digital inclusion" as such, but to broaden your view of digital inclusion beyond access and gender digital divides. An FTF activity can make improvements in access, literacy, and offline benefit for diverse user groups. Utilizing the framework to assess your intentions and organize holistic programming can help achieve more digital inclusion.

Force multipliers

In the context of digital inclusion there are two key multipliers that serve as levers, increasing either positive or negative progress toward digital inclusion. The two multipliers presented here are (1) user stake, or ownership and governance, as applied to overcoming digital divides and (2) social norms, as applied to designing for more and more users.

User stake

We've all heard of the term 'stakeholder' and most of us have probably used it many times in our work. But what does it mean to have a 'stake' in the digital world? In short, it means that you have a degree of control over how data about you or your assets is used by others, you have a say in the design of a digital solution, and your needs are considered by decision-makers who govern the processes that guide how digital technologies are applied in projects that affect you, or you have a literal financial stake in the success of a digital tool. Examples of organizational structures that intend to respond to such principles are platform cooperatives and decentralized autonomous organizations (DAOs).

In the context of the Digital Inclusion Framework, 'stake' has a number of interrelated characteristics that shape how it impacts inclusion. First, stake is a force multiplier that can amplify or diminish power. This means that the more of a stake that you have in a digital tool or process, the more included you are likely to be in its use and the more likely it is to reflect your interests and serve your needs. You are also more likely to want to defend your stake in the tool or process. Conversely, the less of a stake that you have in a digital tool or process, the less likely it is that when it is used it will reflect your interests or serve your needs. In this way, having a stake in a digital process or tool can either help you climb the ladder from likely excluded, through to potentially included, and up to likely included; or, it can result in you falling down rungs in that ladder and being left with very little power. Mobile Vaani is a nice example of a platform where community user groups have obtained a large stake and can therefore ensure that the platform's content reflects their interests (

Case Study Box 1.5

Second, stake can be a type of digital divide. This is because those who are likely to have more of a stake in digital tools or processes are those who are also more likely to have access to technology and data, be digitally literate, and be able to reap the offline benefit of digital tools and processes. If you don't have access to technology and data, are digitally illiterate, or are unable to benefit from digital tools in the physical world, then you are likely falling further behind others whose stake in a digital tool or service is greater than yours.

Finally, your stake in a digital tool or process often reflects the influence you have in the physical world. If you are already excluded from decision-making processes that impact your life offline, then you are more likely to be excluded from decision-making processes that impact your digital presence.

When considering the stake that a particular individual or group has in a digital tool or process, it is important to remember that - like many of the factors that influence digital inclusion - stake is a sliding scale. You do not either have a stake, or not have a stake. Rather, the stake that you have in a process depends on numerous factors. Your stake in a tool or process may be diminished if you have multiple intersecting factors contributing to your exclusion from the digital world. Conversely, your stake may be augmented if those tasked with designing digital projects and tools take the time to understand your particular needs and work to design and implement digital projects that intentionally amplify the stake that you have in them. Ultimately, centralization of power to one or few stakeholders should be avoided, while FTF participants should be in a position where they influence (decisions about) the governance of digital solutions and data.[25]

Case Study Box 1.5

Centering Solutions Around User Stake: Mobile Vaani's Innovative Community Media Model

Mobile Vaani is designed to deliver community-generated media content through mobile phones, specifically tailored for low-literacy populations in India with no internet connectivity or regular access to print media. A significant majority of citizens in rural India face challenges in accessing mainstream media outlets. Approximately 30% of rural communities lack the reading skills needed to effectively consume information.[26] Low literacy is more pronounced among women and low-income households, leaving these groups especially vulnerable to exclusion from mainstream media outlets.

Mobile Vaani was created to bridge this information gap by providing an interactive, voice-based platform that offers curated and user-generated audio content. This content serves to inform listeners about local news and events, facilitate the delivery of public services, and connect rural communities with partner products and services. Callers engage with the platform by dialing into a free voice message system. They then select information of interest through a series of interactive voice response (IVR) menus. To date, over 2 million unique callers have utilized this virtual platform.[27]

What are the users' pre-existing abilities to access, engage and benefit from the digital solution?

The Mobile Vaani infrastructure capitalizes on India's extensive mobile phone network and employs an IVR system to ensure inclusive user engagement. As of 2017, mobile cellular subscriptions had increased to 88% coverage across India's population.[28] This level of coverage establishes mobile technology as a potent tool for enhancing information access, linking rural communities with products and services. The system operates on the 'missed call' concept, allowing users to initiate a call to a Mobile Vaani number, prompting an immediate call-back from the server at no cost to the users. Additionally, the IVR system, compatible with all types of mobiles, offers a range of options for users, including recording, listening to, commenting on, and sharing voice messages. Users can also navigate to different topic and location-specific channels and participate in surveys. This IVR user system specifically caters to poor literacy needs and is also supported on basic mobile devices.

[25] Development Gateway. 2023. *Farmer Centered Data Governance: A New Paradigm.* Available online.
[26] UNSD. 2017. *United Nations Statistics Division: India Country Profile*. Available online.
[27] UNESCO. 2017. *Mobile Vaani Case Study*. Available online.
[28] Ibid.

Centering Solutions Around User Stake: Mobile Vaani's Innovative Community Media Model

In what ways does the project successfully ensure user stake within the digital solution?

Central to the success of Mobile Vaani is its Community Media model which places user information needs at the center of the solution by empowering community groups to create and share original media content. Community participation is facilitated through a network of local clubs led by over 300 community reporters and dedicated volunteers aligned with the Mobile Vaani initiative. These groups undergo training in participatory content generation and play a pivotal role in expanding the user base in their respective regions. Community reporters serve as the linchpin of Mobile Vaani, ensuring the production of high-caliber and locally relevant content. Community reporters also address grievances that can be escalated to government departments and mobilize groups for collective local action. Individuals can further contribute to content creation through submitting voice recordings through the IVR system.

By placing individual and community user groups in control of the platform's content generation and leveraging familiar technology, Mobile Vaani ensures that the platform remains entirely responsive to user needs while also effectively promoting accountability, collective action, and local awareness through accelerated journalism.

Social norms

Have you ever done something only to realize others disapproved or thought it was weird? You've hit up upon an unspoken social norm–informal rules that outline what is deemed acceptable behavior in a given cultural context. For instance, a critical social norm, such as women not traveling alone, may prevail in rural areas but not necessarily in urban settings. This divergence means that women in regions where social norms restrict their mobility are at a higher risk of exclusion from digital tools. Accessing a phone may require their husband's or extended family's approval, introducing additional societal norms into the equation. In this way, social norms act as a multiplier of digital inclusion. We see another example of how a deeply rooted social norm affected women in the AgroMall case in Nigeria. Social norms among men about women's financial independence can prevent these women from taking out individual loans (Case Study Box 1.6).

The impact of social norms on access, engagement, and the benefits of digital tools is profound and can further amplify existing inequalities. Recognizing that social norm change is a slow and iterative process within any community is crucial for designing effective activities that promote digital inclusion. Failure to account for social norms and intersectional identities in these activities may inadvertently reinforce inequalities, granting additional digital advantages to those already privileged, while marginalized individuals miss out on opportunities, entrenching their exclusion.

Efforts and resources must be directed towards fostering positive changes in social and cultural norms. For example, in the case of AgroMall these positive changes were achieved through advocacy initiatives and male training programs. Transformations in social and cultural norms empower those constrained by societal structures to access technology more freely should they choose, contributing to the development of more inclusive digital ecosystems.

Case Study Box 1.6

Addressing Social Norms: AgroMall's Success and Shortcomings in Expanding Women's Access to Agricultural Finance in Nigeria

By leveraging comprehensive customer data gathered from their Digital and Agriculture Platform, AgroMall identified an opportunity to overcome restrictive land ownership rights which prevent women from obtaining agricultural finance in Nigeria. Nigerian women make up 70% of agricultural labor yet they have limited access to productive resources and typically hold smaller land plots than men.[29] Given financial service providers often require confirmation of land rights, social norms dictating that men typically own or inherit land makes it challenging for women to access collateral for agricultural financing.

AgroMall's Digital and Agriculture Platform (ADAP), has supported 1.3 million smallholders in Nigeria in obtaining agriculture finance and access to markets.[30] Through ADAP's digital profiling services, the platform helps producers to leverage key agronomic information to access financial services. As many female users had utilized ADAP's profiling service, AgroMall had gathered valuable demographic, production, transactional, and financial data from their female user group. Using this data, AgroMall aimed to create an alternative credit scoring system, Transform Score, which could encourage banks to lend to women, regardless of land ownership.

How are social norms impacting users' ability to access, engage and benefit from the digital solution?

During the pilot phase of the Transform Score initiative in Nigeria, it became evident that deeply ingrained social norms in rural communities significantly influenced the adoption of the solution, particularly among women. In May 2021, the company initiated a pilot project across five states, enlisting 3,500 field agents to promote the program in rural areas. Field agents observed instances where men attempted to use their wives as intermediaries to secure loans. However, there was notable discomfort among many men regarding women obtaining loans for themselves. These reservations stemmed from concerns that women's financial independence might alter household dynamics, diminish men's influence, and potentially lead to marital strain. Following the initial pilot phase, only 419 producers were able to secure loans, with women accounting for just 25.6 percent of the recipients, falling considerably short of the targeted 60 percent.

In what ways does the project successfully address social norms in relation to their solution?

In light of the pilot results, AgroMall has taken proactive steps to address deeply entrenched social norms through the integration of advocacy initiatives and male training programs. Firstly, AgroMall has developed an advocacy approach centered on garnering support from influential figures such as community and religious leaders, family heads, husbands, and other men. This is achieved through targeted outreach and educational programs, often in collaboration with community-based women's organizations. Secondly, recognizing the importance of involving men, AgroMall started to onboard male agents to shape community perceptions around financially empowering women and prevent resistance to change. It is evident that transforming deeply rooted social norms is a process that requires time and persistence, particularly in overcoming barriers that hinder women from fully benefiting from innovative solutions like Transform Score.

[29] Obodoekea, P., Agbejule, F. and Olusanmokun, O. 2021. *For AgroMall, Extending Credit to Women Requires First Convincing Men*. Available online.
[30] Ibid.

Key Takeaways for Module 1

As you delve into Module 2, remember these concepts and tools for bringing intersectionality into digital inclusion:

- **Overcoming digital divides is not a linear journey**: Access is not the only piece that must be solved for people to enjoy the benefits of digital tools, digital literacy and experiencing offline benefits are important too. When making progress to overcome one divide, it often positively reinforces the progress in the others.
- **The 6 As can be used to assess inclusion**: The 6 As are an entry point into understanding digital inclusion, or exclusion. With the 6th A–accrual of activity benefits–we connect this digital inclusion tool directly to FTF programming, in which offline benefits are the real goal of the activity.
- **Each person has an intersectional identity:** People's life opportunities are influenced by the way their identity characteristics, some are changeable while others are fixed, intersect, interact, and then compound relative advantage or marginalization. Their intersectional experiences are likely to determine needed programmatic interventions to ensure offline benefit is achieved by participants.
- **Likelihood of inclusion in digital activities is a combination of intersectionality, empowerment as a producer, and digital journey (**Figure 1.**)**: Intersectional identity combines with each individual's journey to overcome digital divides and their relative empowerment as a producer. When these three domains of their life are understood as intersecting, we can understand how likely a person is to be included in an FTF digital intervention.
- **These building blocks create the Digital Inclusion Framework**: The Framework moves away from access as the key divide and gender as the key marginalized group to encourage broader, more systems-level thinking about how to create digital inclusion.

By remembering the diverse needs of different user groups, you can create programming and digital tools that help overcome digital divides for more and more users, ensuring progress on digital inclusion.

Want to learn more? See our curated list of resources.

Module 2: Understanding Intersectional Users for Inclusive Digital Design

Having gained insights into digital inclusion, digital divides, and intersectionality, it's time to translate this knowledge into practical applications for the future users of the technological solution that may be developed for the digital intervention of an FTF activity.

Module 2 guides you in understanding and profiling your anticipated users, who will play a pivotal role in using the digital technology. In three key steps, you will analyze your target users: Who are they, and what characterizes them from an intersectional perspective? Where do they stand as adopters of innovations? How ready are they to embrace and benefit from digital technologies?

At the end of the module you'll find deep dive sections on important cross-cutting themes that we encourage you to take into account. The final section of this module offers practical guidance on implementing an inclusive and responsible design process within your FTF activity. Overall, the module emphasizes the need for active user engagement and iterative approaches for a more effective, and inclusive, outcome. We start the module by explaining why this is necessary.

Placing Participants at the Center

Historically, digital development attempts have sometimes fixated on technology, sidelining local needs and practical problem-solving. This approach leads to solutions in search of problems, hampering digital tool adoption, particularly among marginalized groups, and limiting offline benefits for participants.

However, a shift is underway. Designers and implementers of digital innovations are now increasingly prioritizing local needs and user-driven solutions. This places the participant—as the intended user of a solution—at the forefront of program and intervention design. The shift to user-centricity, with initiatives such as the Principles for Digital Development underlying it, also means that FTF activities with a digital intervention need to absorb elements of user centered design (UCD), inclusive design, and responsible design.[31] The approach changes the focus from technology-centricity to user-centricity and empowerment, leveraging local expertise to create meaningful solutions that resonate with the real-life needs of participants. Finally, as we will see in the remainder of the module, it is an approach whereby users and other stakeholders actively participate in defining the digital solution that will support solving the problem that an FTF activity aims to address, formulating the best-fit solution(s) to this problem, and designing these solutions.

In the next section we present you with a general overview of what this transformative approach could look like in practice. Thereafter you'll be practicing with steps 6-9 of the approach's empathize phase through various activities. Through this you will gain a deep understanding of and empathy for participants, both as users of digital technologies and as the people whom your FTF activity aims to benefit.

[31] DIAL. 2016. Principles for Digital Development. Available online.

An Inclusive Design Process

Those familiar with the four principles of USAID's Program Cycle will observe that the inclusive design approach that we present in Table 2.1 incorporates these principles.[32] It means that the recommended design process should be flexible and iterative, encompass the entire digital program cycle, support collection of data and evidence to guide decisions, and lead to solutions with sustainable impact. This way you are in the best position to accommodate for diverse intersectional identities, and to create digital solutions that are responsible, have offline benefits for users, and help an FTF activity to have sustainable impact.

[32] The principles are: Apply analytic rigor to support evidence-based decision making; Manage adaptively through continuous learning; Promote sustainability through local implementation and financing; and Use a range of approaches to achieve results.
See also: USAID. 2022. ADS Chapter 201 Program Cycle Operational Policy. Available online.

Table 2.1: Overview of Phases in an Inclusive Design Process

Process phase	Core focus of the phase	Sub-phase	Objective of the phase	Steps in the phase
Understand	Observation of the current situation and problem(s), the context in which they exist, and who is affected by them. Identification of diverse participants as users of a solution to the problem(s)	Empathize	*Use research to get to know your user(s) and their intersectional identities*	1. Formulate the problem for which you may want to develop a digital solution[33] 2. Conduct a Gender and Social Inclusion Analysis + baseline study 3. Formulate if, when, why, and how you plan to use digital technologies in your solution 4. Conduct a (rapid) digital ecosystem analysis if it is does not exist for your country[34] 5. Conduct a stakeholder analysis[35] and a Gender and Social Inclusion Analysis *User research sub-phase:* 6. Identify the potential end users for your solution 7. Develop intersectional personas for your end users 8. Analyze the personas with an adopters' lens 9. Assess the user readiness of the end users 10. Identify initial capacity development needs and build a capacity development strategy
		Define	*Identify the challenges and opportunities that impact your users based on research data and real-life observations*	1. Engage with potential end-users and other stakeholders to understand their lived experiences. Pay specific attention to intersectional dimensions and potential factors for in- and exclusion 2. Share and validate findings from stakeholder engagements 3. Anticipate desired and undesired outcomes, and impact of a solution to your identified problem for social, environmental, and economic sustainability dimensions[36] 
Explore	Ideation of possible solutions to the problem and selection of the most promising ideas	Ideate	*Generate a variety of (creative and innovative) ideas for potential interventions*	1. Develop a design team with the right skills and inclusive mindsets[37] 2. Identify what matters most and least to people i.e., needs, demands, aspirations 3. Develop ideas that can reach more diverse or fewer diverse users, be more or less inclusive, and have more or less offline benefits 4. Identify which ideas match better or worse with overall project objectives 5. Collectively decide what intervention to prototype 6. Assess if similar interventions already exist 7. Identify existing digital hardware and software that can be integrated in intervention prototype 

[33] A recommended tool is USAID's Digital for Resilience and Food Security (RFS) Planning Tool which helps you to determine if digital technologies may be useful for your activity scenarios. Available online.

[34] Existing ecosystem studies may be the USAID digital ecosystem country assessments and digital agriculture ecosystem assessments, but also publications by other actors.

[35] Identify: who is affected by the problem? Who may help to solve the problem, and who is already actively working on it? Who has a stake in solving/maintaining the problem? Who is in a position to steer governance of the problem (and who is not)?

[36] Building on the acknowledged concept of Responsible Research and Innovation. René von Schomberg. 2011. *Towards responsible research and innovation in the information and communication technologies and security technologies fields.* publication office of the European Union, Luxembourg. Luxembourg: Publications Office of the European Union. Available online.

[37] Engage stakeholders and secure their input with inclusive mindset types: collaborative relationship builder; conscientious advocate; Informed partner; curious researcher; knowledge builder), having them all included on a design team fosters effectiveness. IDEO. Available online.

Process phase	Core focus of the phase	Sub-phase	Objective of the phase	Steps in the phase
	to develop further	Prototype	*Turn the most suitable intervention ideas into prototypes that can be tested in the field*	1. Establish partnerships with hardware and software providers whose products you want to integrate in prototypes 2. Quickly develop simple prototypes for each shortlisted solution 3. Pre-test the prototypes with different with user groups that you expect to be likely included, possibly included, and excluded 4. Decide which prototype(s) are a best fit for different target user groups and that you want to pilot in the field 5. Based on pre-test: evaluate capacity development needs identified in empathize phase and adapt capacity development strategy 6. Develop high quality prototypes that can be used as minimum viable products (MVP)[38] in a real-life setting
Materialize	Testing and piloting the solution to see how it performs in a real-life context	Test and iterate	*Test your prototype and gather feedback from users and other actors*	1. Identify where to pilot the prototype (MVP) and with whom 2. Identify local champions of change 3. Build local (tech) support teams[39] 4. Define when the pilot is successful 5. Pilot the solution in multiple communities, with advantaged, disadvantaged, and marginalized people 6. Collect feedback from users, support actors, stakeholders, and project staff 7. Analyze feedback 8. Reflect on appropriation of the digital technology by users 9. Identify unintended consequences of solution 10. Iterate design of solution based on feedback
	Implementation and scaling of the solution with continuous monitoring and evaluation of its impact	Implement	*Move from a small pilot to large(r) scale implementation of your intervention and monitor and evaluate outcomes and impact*	1. Develop a strategy for responsible scaling 2. Develop an implementation roadmap 3. Assess your (project) resources 4. Develop a business plan 5. Build scaling partnerships 6. Develop a sustainability plan[40] 7. Develop MEAL plan[41] 8. Launch solution at scale 9. Continue capacity development where required 10. Perform MEL followed by intervention iterations

[38] A Minimum Viable Product (MVP) is an early version of a product that is usefully functional and that can be pilot tested with a small group of the target users to gather feedback and quickly iterate the product prior to launching it at scale.

[39] For example to: get stakeholders involved; To provide mentorship and (technical) support and backstopping to users; To monitor and evaluate participation, outcomes, and impact; To identify bottlenecks early-on. See also this toolkit: steps 3, 4, 7, 8, and 9.

[40] Prepare for a project or intervention's long-term sustainability and the promotion of continued positive change even after the lifespan of a project, within the context of natural resource considerations and within the context of impact, considering both present and potential future conditions.

See also: USAID. 2023. *How to Apply GDD Best Practices in USAID Programming*. Available online.

[41] The MEAL plan should include impact indicators that are relevant to measure Activity impact as well as specific offline benefits. Beyond a baseline and endline survey it is recommended to implement regular rapid MEL assessments (e.g. every 6 months) to measure impact and iterate programming where needed. See also Module 3 for a more elaborative explanation of the use of rapid assessments.

Identifying potential end users of an FTF-related digital intervention

Which problem do you want to solve for whom? In other words, who are your intended end users and why? When envisioning the participants in an FTF activity, you might initially think of producers, possibly categorized as male, female, or youth producers. However, as Module 1 highlighted, the diversity within these groups can be quite intricate.

The first activity in Module 2 aims to encourage a deeper exploration of this diversity among FTF participants. It involves mapping potential users of digital technologies within the Intersectional Digital Inclusion Framework. By completing this exercise, you will gain an initial understanding of (1) the diverse end user groups among the participants in your FTF activity, and (2) which user groups are more likely included and which are more likely excluded in a digital program.

Activity 2.1

Identifying user groups in your FTF activity context:

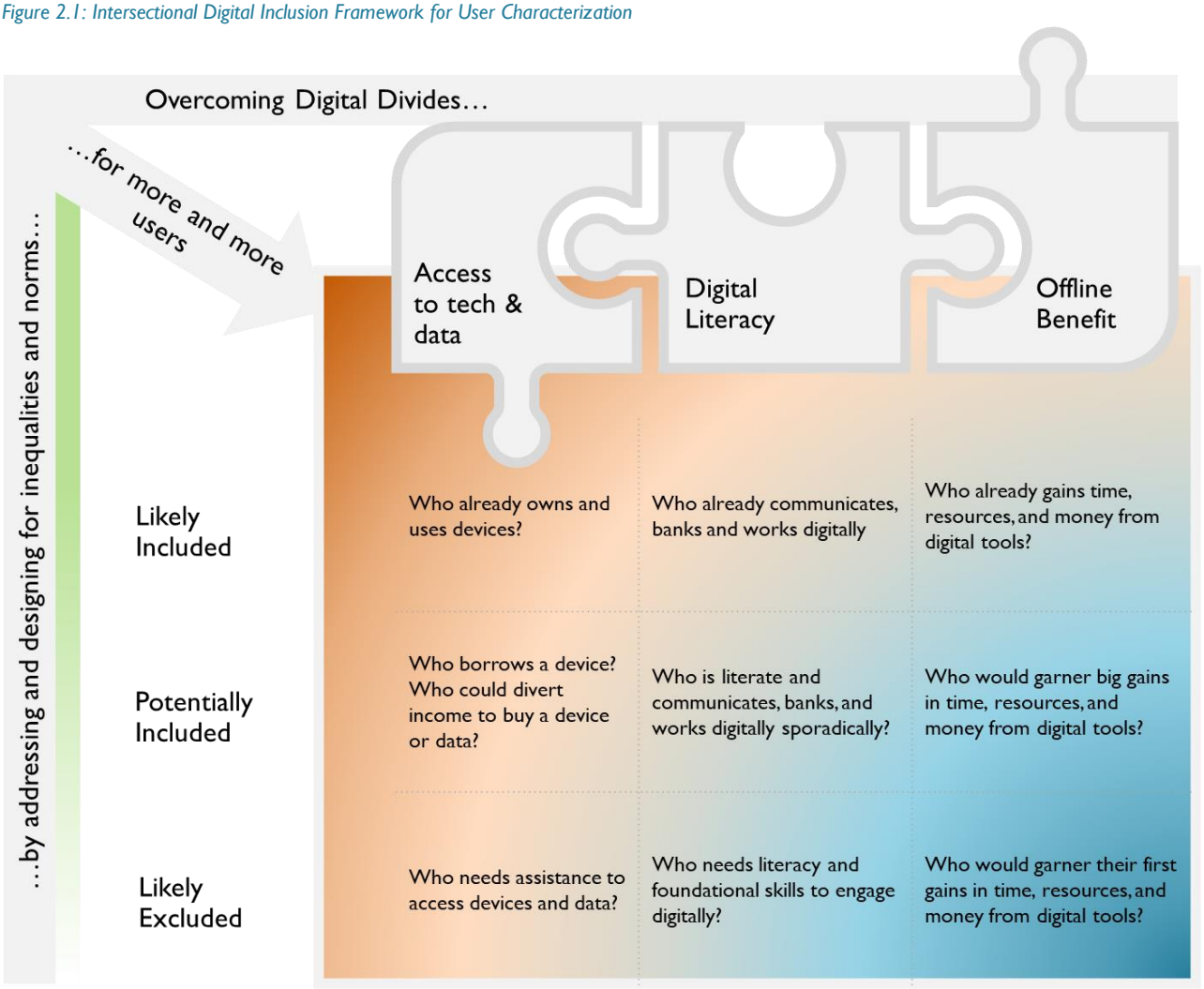
Consider the producers, local SMEs, and other intermediaries who are the participants in an FTF activity that you are currently involved in.

1. Consider the individual producers and other actors within this community beyond their identity as agricultural producers or intermediaries - what other aspects of their identity would you like to consider when thinking about sub-groups within the larger group of producers? *(Hint: Think from the perspective of the dimensions of the Intersectionality Wheel and Inclusion wheel that you used in Module 1,* Figure 1.5*and* Figure 1.*, to construct your own intersectional identity.)*

2. Looking at the sub-groups that you have identified: Based on your experiences from working with these participants, where do they currently stand in terms of their access to digital technologies, digital literacy, and offline benefits?

3. Utilize the Intersectional Digital Inclusion Framework as provided below in Figure 2.1 to map various sub-groups within your producer community into different quadrants. What are your observations? Any surprising outcomes in regard to likely included and likely excluded sub-groups?

Figure 2.1: Intersectional Digital Inclusion Framework for User Characterization



Building intersectional personas

The previous activity provided initial insights into the intersectional diversity that is present among FTF participants. Now, let's take this a step further. Do you recall the five user personas introduced in Module 1? In the upcoming activity, you'll create personas for your FTF participants. User personas serve as valuable tools for fostering empathy with the individuals and groups targeted by FTF activities.[42][43] These personas provide a detailed description of a person. They are typically fictional but based on real individuals, highlighting their intersectional identity, living, and working context, preferences, challenges, opportunities and, ideally, their needs, dreams, and aspirations. Personas enable activity developers, designers, and implementers to understand their participants as the potential users of a digital solution. This enables them to design and develop from the participant's perspective.

[42] Jens Anderson. 2023. *Resilient rural women: Applying personas and insights for climate-smart innovation.* Slide Deck. CGAP, Washington D.C. Available online.

[43] Jonathan Steinke & Charlotte Schumann. 2022. *Rapid Inclusivity Assessment for Digital Agriculture Services.* Alliance of Bioversity International and CIAT. CGIAR Research Initiative on Digital Innovation. Available online.

Activity 2.2

Developing personas for your participants

Ready to create the personas of your FTF participants? Let's give it a try and look at what characterizes your participants as potential users of a digital solution.

Use the FTF Digital Inclusion Wheel (see Figure 1.5) and the user profile format (recall user personas) to develop the intersectional personas of one or multiple of the user groups that you identified in Activity 2.1. Imagine a typical individual in this user group, and consider this person's:

General intersectionality dimensions

- This person's: gender and sexuality, age, education level, marital status
- What the person does for a living and to generate income
- Who this person's family members are
- The location where this person lives and the infrastructure that is present there
- The type of community in this location
- The social status of this person in the community, i.e., how advantaged, disadvantaged, or marginalized the person is compared to others in the community
- Specific (religious or support) groups that this person is a member of
- How this person may be positively or negatively affected by social norms and biases
- Particular needs, dreams, and aspirations of this person
- Others? Add dimensions that are relevant for your FTF context.

Technological dimensions

- The (digital) literacy level of this person
- The existing access to and use of digital technologies by this person and other family members
- The person's awareness about and interest in digital technologies
- Specific resource, social, or physical constraints that this person may face to access and benefit from digital technologies
- Existing support systems that could help this person to access and benefit from digital technologies

1. Repeat the exercise until you have developed personas for each of your user groups.
2. How do your personas compare with the user profiles from Module 1? What more have you learned about how your users are affected by digital divides and their likelihood to be included or excluded from access, digital literacy, and offline benefits?

Looking at users from an innovation adopters and user readiness perspective: it's not about attitude but opportunity

If there's one thing that Module 1 and the previous sections of Module 2 have emphasized, it's the immense diversity among participants and where they currently stand as adopters of, and beneficiaries from, digital technologies. Too often, intervention developers and implementers dive into designing their interventions without understanding the diversity among their intended users until the first prototype is complete. A more effective way would be to consider diverse end user's capacity from the start. In this section of the toolkit we zoom in on two concepts that can help you to develop insight in your FTF participants as adopters of digital technologies early on. Recognizing intersectionality in the capacity of participants to adopt, use, and benefit from a digital intervention is pivotal if you strive to design digital interventions that are culturally sensitive, and that foster inclusive and responsible adoption by intersectionality diverse user groups. Therefore, the insights that you gain from this

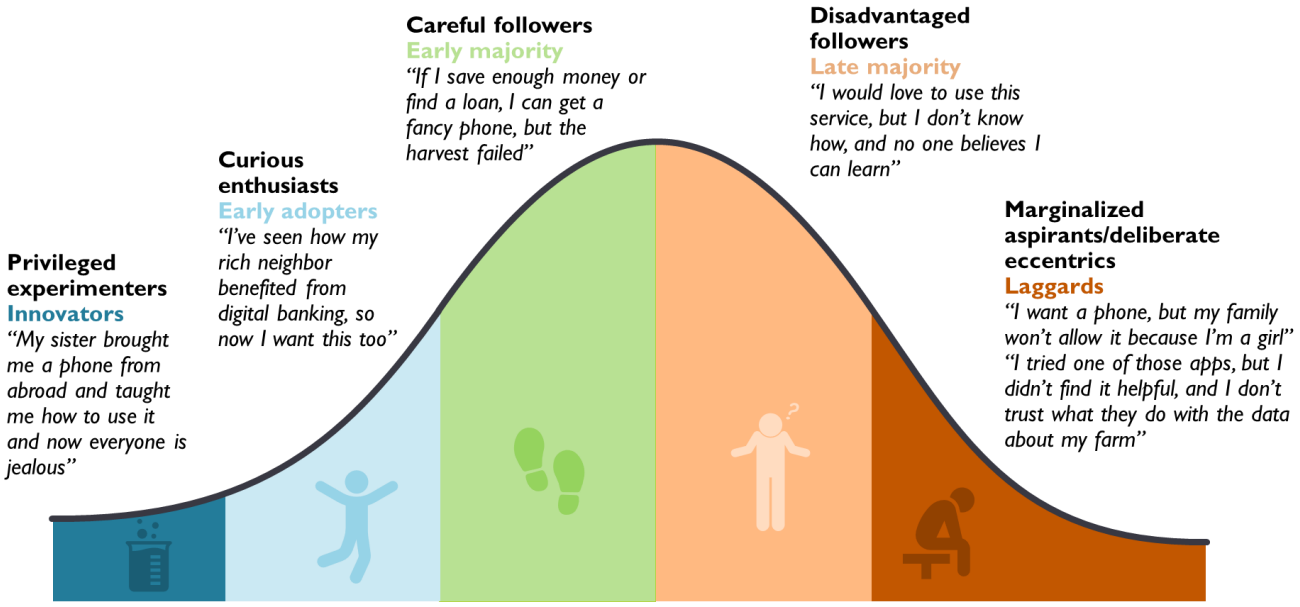
section can inform the development of digital interventions that align with your participants' innovation adopter profile and their user readiness.

Participants as innovation adopters

For a participant to become a user of a digital technology, the person first needs to adopt that technology. A well-established model about technology adoption is Everett Rogers' Diffusion of Innovations model.[44] This model categorizes adopters into five groups: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. The innovation model implies that everyone has equal access, ability, and affordability to embrace an innovation, and that individual attitudes ultimately drive the adoption of new technologies. In practice it is not that simple, most certainly not in agricultural development contexts.[45]

Consider two important caveats. First, the original model mistakenly suggests that the adoption of (in our case digital) innovations follows a linear process. This implies that, with sufficient effort, nearly everyone, except for laggards perhaps, can and will be reached. The second caveat is that it may seem as if the late majority and laggard groups consist of individuals who reject new technologies and progress, deliberately choosing to stick to traditional methods. The reality is more nuanced. Slow or non-adopter groups may face barriers and challenges that stem from their intersectional identity or prevailing social norms. For example, people may not have access to devices and data, lack the skills to use digital tools, or may not experience offline benefits easily. This can hinder their ability or willingness to adopt digital technologies. The below graphic reflects these nuances, including updated labels for each of the adopter groups and examples representing some aspirations and barriers that a person in each category may experience.

Figure 2.2: Innovation Adopters in Developmental Contexts and as Intersectional Users



[44] Everett Rogers. 2000. A Prospective and Retrospective Look at the Diffusion Model, Available online.

[45] Cees Leeuwis & Noelle Aarts. 2021. Rethinking Adoption and Diffusion as a Collective Social Process: Towards an Interactional Perspective. Available online.

Activity 2.3

Analyzing Personas through the Lens of Adopter Categories

Now that you understand the relation between adopter categories and intersectionality, let's revisit the personas you created for the participants that will potentially become end users in your FTF activity. Consider the following questions (see Figure 2.2 for guidance on the adopter categories):

1. In which adopter category do your anticipated end users fall?

2. What factors place them in that category? Consider the specific advantages and privileges of connected experimenters and privileged enthusiasts, as well as the barriers and challenges faced by the self-determined and disadvantaged followers, marginalized aspirants and deliberate opt outs.

3. How does adoption differ among likely included, potentially included, and likely excluded user groups?

4. Can you think of features in a digital technology that could facilitate adoption among the disadvantaged followers, marginalized aspirants, and deliberate opt out groups, promoting their inclusion?

5. Have some end users intentionally chosen not to adopt digital technologies? If so, why? Is it critical that these users still become included? Can their reasons to reject or de-adopt digital technologies be addressed (e.g. think about changes in the technology's content, user experience, or offered benefits; terms of use; or assigning trusted (digitally-enabled) intermediaries)?

Defining the user readiness of your participants

Now that you know where your FTF participants stand as adopters of digital technologies, you can zoom in further by asking the question: '*Are our participants ready to adopt, use, and benefit from digital technologies?*' This means that you'll assess the participants' capacity, or so-called user readiness, encompassing their capabilities, opportunities, and motivations.[46]

Have a look at the example of Rainforest Alliance's Farmer Training App. In this case, Rainforest Alliance conducted a needs assessment early on to define digital capacity, which turned out to be limited. This led to design choices that made the Farmer Training App usable for farmers with lower digital literacy. (Case Study Box 2.1).

[46] Mariette McCampbell, Adewopo, J., Klerkx, L., & Leeuwis, C. 2023 Are farmers ready to use phone-based digital tools for agronomic advice? Ex-ante user readiness assessment using the case of Rwandan banana farmers, Available online.

Case Study Box 2.1

Understanding User Readiness: The Success of the Rainforest Alliance Farmer Training App (RAFTA) in Designing in Line With User Capabilities.

The Rainforest Alliance Farmer Training App's design process was anchored in thorough assessments of user needs and capacities, to ensure the platform had meaningful impact. The RAFTA initiative was developed for producers who are either currently Rainforest Alliance Certified or preparing for certification by supporting users through sustainable agriculture training. The Rainforest Alliance initially identified a need for a tablet training app aimed at Guatemalan coffee producers after recognizing their heightened vulnerability to climate change impacts. To ensure genuine accessibility, the design process started with capability assessments of the pilot communities in Guatemala, focusing on key factors such as reading proficiency, digital literacy and prior content knowledge.

What are their pre-existing abilities to access, engage and benefit from the digital solution?

The initial needs assessments revealed limited digital readiness amongst the pilot users and led to design choices which focused on making the interface simple and easy to navigate. Specifically, 19 percent of the producers interviewed could not read or write and 38% had attended less than three years of school.[47] Many of the producers indicated they were not familiar with tablets and other types of smart technologies when presented with the app for the first time. Further, over 60 percent of respondents had income levels below Guatemala's established poverty line and indicated that data packages were often financially unattainable. With this in depth understanding of user capabilities, a text-light platform that could operate offline was selected, utilizing software that did not rely on costly data packages.

In what ways does the project successfully consider user readiness within the design process?

Throughout the design process, ongoing assessments of user needs provided valuable insights, enabling the project team to refine content delivery methods to promote inclusivity. In addition to the initial needs assessments, workshops were conducted throughout the pilot's duration to further evaluate and tailor information to the producers' specific needs and skill levels. During the software development phase, the team shifted from text-based to visual learning tools, including videos and image libraries showcasing best management practices, to better support users with lower literacy levels. All features were designed to operate offline, however, in some areas low bandwidth and subsequent longer download times did act as a deterrent to users downloading the app. To counteract this, the project team targeted certified group administrators and trainers, or 'lead farmers' who typically had greater access to the internet and could support access to the platform across the community. Moreover, investments were made in regional staff to assist in the development and training of digital skills.

While the platform is still relatively early in the project lifecycle, the use of the app has persisted among pilot communities and deployment of the app has expanded into neighboring countries in Latin America. The initial in-depth understanding and continuous sensitivity of user needs enabled RAFTA to enhance the effectiveness and influence of its solution, while also ensuring an efficient use of resources during the solution's rollout.

[47] CRECER. 2014.*Viabilidad para la Implementacion de una Red Social – SCN – con Productores Certificados Rainforest Alliance en Guatemala.Guatemala City*,

Your motivation for conducting a user readiness assessment before program or intervention design should be that it can help you to formulate achievable activity goals, realize impact at scale, and foster considerations of inclusivity, sustainability, and responsibility in interventions. Thus, assessing user readiness at the outset of designing a digital intervention of an activity allows you to:

1. Identify which participants, as intended user groups, are currently the most 'user-ready' for digital interventions.
2. Pinpoint specific capacity development needs for diverse participant groups to enhance their 'user readiness.'
3. Formulate realistic activity goals, and anticipate potential bottlenecks for achieving inclusivity, sustainability, and tangible benefits in relation to these goals.
4. Make informed decisions regarding the most suitable hardware and software technologies for the digital intervention of your FTF activity.

How are adopter categories and user readiness mediated by intersectionality and social norms?

The intersection of innovation adopter categories, user readiness, and individual identity unveils a complex interplay of social categories that significantly influence an individual's capacity to engage with digital technologies.

Direct Effects: Certain dimensions, such as gender, sexuality, wealth, or literacy, directly mold a person's user readiness. These dimensions shape an individual's abilities, agency, and stake concerning digital technologies, particularly in terms of creating social opportunities to access, use, and benefit from digital tools. For instance, gender-based norms can restrict or empower individuals, determining their capacity and comfortability to adopt digital tools.

Indirect Effects: Intersectional dimensions can also exert more subtle, indirect influences on user readiness. Individuals may be motivated to embrace digital technologies or, conversely, deliberately exclude themselves due to social norms. For instance, women from religiously conservative backgrounds may opt to self-exclude from social media platforms due to apprehensions about disapproval from their husbands, in-laws, or community members. Think of someone who identifies as queer in a country where this could lead to prosecution. This person's opportunity to adopt a digital service may depend on the service provider 's ability to guarantee safeguarding of the person's data from government scrutiny.

Motivation for Inclusion and External Pressures: Target users may harbor strong motivations for digital inclusion, expecting both material and social benefits from their inclusion. External pressures can further compel users to seek inclusion, driven by factors like peer influence or government incentives, such as agricultural subsidies that are tied to digital registration. Vice versa, participants may have strong motivations to self-exclude, for example when offline benefits are intangible or irrelevant to them, when they distrust a service provider, or when they are concerned about the impact of digital technologies on their agricultural practices or identity as agricultural producers

Activity 2.4

Assessing User Readiness for Planning a New Activity

Let's simplify the concept of user readiness and provide a set of specific questions that you can ask to and about potential users and the context in which you plan to use digital technologies. Depending on if you are already certain that there will be a digital intervention in your activity or not, these questions can serve as

Assessing User Readiness for Planning a New Activity

(part of) a baseline survey exercise (see Module 3 to learn more about this). We acknowledge that this exercise will require time and effort from you, but you can be certain that the results can provide you and your colleagues valuable insights and guidance for the design of a best-fit digital intervention.

Activity Goals

1. What are the main objectives of this FTF activity?
2. Where and for what purpose do you intend to use digital technologies in this FTF activity?

Awareness

3. Which devices are intended users acquainted with and actively using?
4. Which software and services are they aware of that they also believe could support them in their day-to-day life?
5. Which potential offline benefits of digital tools, such as improving production or business revenues, are they aware of?

Availability and Affordability

Infrastructure

6. Is there adequate telecom infrastructure where intended users reside? (including reliable data and/or broadband connectivity, and electricity for charging their devices)

Device

7. How do potential users access the devices they are acquainted with, and afford their use?
8. Do they actually own the hardware, or do they rely on others to access a device?
9. What type of devices do they own and what is the condition of the device(s)? (e.g., cracked screen, missing buttons)

Services

10. Are affordable data packages and airtime bundles available to potential end-users?
11. Which software do they already access and use? And in which format and language(s) are they offered?
12. Why and how do they use these applications?
13. Do they encounter any issues with the affordability of these services?
14. What are the top 5 most-used services among potential users?
15. Could affordability (over time) become an issue over time for potential users? If so, when would digital technologies become unaffordable?
16. How significant is the balance between supply (offered technology) and demand (offline benefits achieved), and how soon should benefits become apparent? (i.e., what level of financial risk can users take, and how much trust are they willing to place in sharing personal/household/farm/community data before gaining offline benefits?)

Ability

General Digital Literacy

17. What is the overall digital literacy status of potential users?
18. Which types of technologies align with their literacy levels?
19. Are there any physical ability issues that might hinder users, like disabilities or specific physical characteristics?

Functional/Operational

20. Can potential users use simple, feature, and/or smartphones for calls, SMS, USSD?
21. Do they know how to open apps, type, swipe, change phone settings, and access the internet?

Foundational:

22. Do they know how to navigate search engines?

Assessing User Readiness for Planning a New Activity

23. Are they proficient in using communication channels, like social media and email?
24. Can they create content, such as documents?
25. Do they commonly use government e-services?

Community
26. What are local individuals or organizations who are digitally fluent?

Safety:
27. Do potential users grasp the concept of a digital footprint?
28. Are they aware of user rights and the ability to change default settings (e.g., consent, opt out, reject cookies)?
29. Do they know how to respond to a security breach effectively?
30. What capacity-building activities could enhance the digital literacy of potential users?

Agency and Accrual of Benefits
31. What social opportunities do potential participants have to use digital technologies?
32. What factors challenge their adoption and use? (e.g., consider social norms)
33. How much agency, autonomy, and stake do they have to decide about resource allocation?
34. Which other social factors may impact the offline benefits they can attain? (e.g., participation in extension meetings, membership in cooperatives or savings groups)
35. What (de)motivates them to adopt digital technologies? Think about intrinsic motivations, (e.g., innovativeness, a desire to become wealthy) and extrinsic motivations (e.g., financial incentives, chances of social exclusion, or disincentives like fines or threat of social exclusion)

We have now covered four activities through which you could empathize with FTF participants as potential users. As shown in Table 2.1, the design approach does not end there and there is a lot more ground to cover. The most important thing is that, in every step of the way, you put the user at the center, designing a solution that fits their unique intersectional identity, and their specific capacity, needs, and demands. In the remainder of the module, we cover three cross-cutting themes for consideration in any FTF activity that adopts digital technologies.

Harnessing Local Digital Champions

Digital solutions are always integrated into pre-existing ecosystems, and these ecosystems can either pose challenges or offer valuable opportunities for program success. There is an opportunity to make use of existing digital champions in the ecosystem.

Users of digital technologies often encounter hurdles during adoption and usage, and human support is frequently needed to overcome such challenges. Trust is another critical factor in adoption decisions, and people tend to place more trust in services that are linked to individuals or organizations with whom they are familiar. Thus, the support of local actors, such as extension agents, local business owners, or community leaders, can be a critical factor for the success of your digital solution.

Local digital champions typically provide various forms of support to users. To do this successfully, they need to have a high level of respect and trust within their communities.[48] Local champions who act as intermediaries can play a crucial role in the adoption, retention, and success of demand-driven technologies. Additionally, involving

[48]Simon Fielke, Taylor, B., Jakku, E. 2020. Digitalisation of agricultural knowledge and advice networks: A state-of-the-art review. *Agricultural Systems*, 180, 102763.

local champions in intervention design ensures that local expertise, including insights into social norms and stake, is integrated into the digital service and the intervention design from the outset.[49] See the Digital Green's generative AI chatbot for an example of champions in action!

As much as the involvement of local champions is important, there are two potential risks. One issue can arise when implementing partners choose to work exclusively with a limited number of trusted stakeholders. These stakeholders may not always be the best match for your current activity. Every FTF activity is unique, and the stakeholders who best fits a specific context and are most trusted by participants may differ from one activity to another. Another risk occurs when selected champions are also powerful individuals with a lot of stake in the community. For example, the choice to make existing smartphone owners digital champions in a community could unintentionally mean that only middle-aged men with social status are being selected. As a result, women, particularly younger women, could feel uncomfortable approaching the person who is supposed to be a trusted source of assistance.

In summary, adopting a one-size-fits-all approach to partnerships with local stakeholders can perpetuate existing inequalities and foster new disparities. Consequently, it is vital to consider the specific context and requirements of each activity when you select the local organizations and individuals with whom you intend to work.

Case Study Box 2.2

Harnessing Local Partnerships: How Engaging with Local Communities Allowed MicroMentor to Achieve Scale

The MicroMentor digital mentoring platform is designed to increase access to social capital and business know-how via mentoring for under-resourced entrepreneurs, especially women entrepreneurs. According to a World Bank report, a significant factor contributing to the profit disparity between male and female entrepreneurs in sub-Saharan Africa is the difference in their professional networks.[50] Women are often found to have smaller networks, typically consisting mainly of friends and family. In response to this challenge, MicroMentor, a program operated by Mercy Corps, strived to broaden these networks by linking entrepreneurs with mentors from over 50 countries, typically through mobile phones or computers.

What are the users' pre-existing abilities to access, engage and benefit from the digital solution?

MicroMentor's deployment strategy in Ethiopia underwent multiple iterations due to unsuccessful marketing attempts, necessitating a reevaluation and localization of previously successful outreach models. MicroMentor launched its program in Ethiopia in 2020 with a view to target women in the Somali region where Mercy Corps had seen an expansion in digital solution uptake and engagement. Initially, the program used English digital advertising campaigns, which had proven effective in other regions. These marketing efforts, however, were unsuccessful in Ethiopia, with very limited uptake for both male and female mentors and entrepreneurs. To enhance outreach, a local content creation firm was hired to develop localized and gender-specific marketing content. The strategy was adjusted by translating adverts into the Somali language and tailoring campaigns to feature testimonials from local female entrepreneurs. Additionally, adverts were tested by

[49] Mariette McCampbell., Schumann, C., & Klerkx, L. 2022. Good intentions in complex realities: Challenges for designing responsibly in digital agriculture in low-income countries. *Sociologia Ruralis*, *62*(2), 279-304.
[50] Francisco Moreas Leitao Carripos et al. 2019. *Profiting from Parity: Unlocking the Potential of Women's Businesses in Africa*. (World Bank). Available online.

Harnessing Local Partnerships: How Engaging with Local Communities Allowed MicroMentor to Achieve Scale

focus groups to see what content resonated with prospective users. This revised digital marketing approach saw greater success, especially in urban areas, although platform adoption still didn't reach the desired levels.

In what ways was the project successful in harnessing local partnerships?

While MicroMentor's iterative approach was eventually successful in promoting local engagement, the case highlights how significant loss in time and resources can occur when failing to understand user needs and preferences from the onset. MicroMentor, with support from the World Bank and local research institutions, conducted qualitative analysis to inform engagement strategies. The research highlighted limited formal mentoring experience among Somali entrepreneurs, who primarily rely on informal guidance from family and friends. Family connections were also found to be a central pillar for business financing and advice, emphasizing the importance of personal relationships in the local entrepreneurial ecosystem. Many entrepreneurs in the Somali region also exhibited distrust towards web-based network services; preferring face-to-face interactions and local support networks.

It was recognized that a tech-driven approach alone would not suffice. Therefore, MicroMentor implemented a face-to-face recruitment strategy to build trust with potential users. **This involved utilizing a network of local agents, billboards, ministry media, word of mouth, and other conventional and trusted communication channels to reach a wider audience.** Agents were able to address literacy and digital skill gaps as well as facilitate feedback loops for initial platform use. In the end, MicroMentor succeeded in enhancing mentorship engagement in Ethiopia and the platform is now available in the Somali language, in addition to English, Spanish, Arabic, and Indonesian. This was achieved by gaining deep insights into user preferences and engaging trusted community intermediaries to advocate for the value of the solution to users in person.

Considering local and indigenous knowledge and including it in the digital technology and intervention design

Inclusion is not just about who is included but also about which knowledge is valued and integrated. Incorporating local and indigenous, experiential knowledge and practices into digital tools is crucial. It can build trust and foster inclusion because:

1. Local and indigenous knowledge are locality-specific and can offer unique advantages over more general scientific knowledge.
2. Including local and indigenous knowledge in digital technologies preserves valuable wisdom from being lost. For example, an agricultural advisory application can adopt both scientific and experiential content.
3. Local and indigenous communities may distrust digital technologies. This is not only due to privacy and rights concerns, but also because they do not know if the information provided through them can be trusted.[51]

Many communities, particularly indigenous communities, have always relied on local and indigenous, experiential knowledge due to limited access to external knowledge. Digital technologies provide an opportunity to bridge the traditional information access gap and create an opportunity to establish new knowledge bases that combine local,

[51] Andy Bonaventure Nyamekye, Dewulf, A., Van Slobbe, E., & Termeer, K. 2020. Information systems and actionable knowledge creation in rice-farming systems in Northern Ghana. *African Geographical Review*, *39*(2), 144-161.

indigenous and external wisdom. Within these communities there is an even greater need to develop clear data sovereignty and ownership procedures that are agreeable to community members.

Activity 2.5

Is local knowledge considered?

By delving deeper into the inclusion of knowledge, you can develop interventions that are not only inclusive in terms of users but also inclusive of local knowledge.

(This exercise works best for an FTF activity you are familiar with that has or will have a digital intervention. If you cannot think of such an activity, you can use the Digital Green's case study in Module 4 as an example.)

1. What knowledge is included in the digital technology that is used in this activity?

2. Who contributed this knowledge? Indigenous knowledge holders, local leaders, academic researchers, etc?

3. What other local, indigenous knowledge could be included, and why is it important that this happens?

4. What type of (food) system emerges from integrating knowledge from these different sources? Does it align with the current system? Identify potential challenges and conflicts and propose solutions to overcome them.

5. Ultimately, who owns and benefits from the knowledge, practices, and technologies included in or emerging from the activity's digital intervention? (e.g., who holds patents? How is intellectual property managed?)

Think before you start: Designing Responsibly for Digital Technologies

In the realm of agriculture and rural development, the interconnected nature of digital technologies with a broader ecosystem and the need to build partnerships in and develop sustainable business models for these ecosystems is well-acknowledged. Within all this, environmental and social impacts are unfortunately often neglected or left to the last. However, we are more and more made aware about the environmental impacts of digital technologies. They can strain resources like electrical grids, generate digital waste, drive demands for data centers and mining. Socially, digitalization may impact areas such as social cohesion, political stability, and polarization.

Developers and implementers have a responsibility when they choose to work with digital technologies. Promising positive impacts on livelihoods necessitates a commitment to do no harm to participants, particularly those who are vulnerable, marginalized, and at risk of abuse. Negative environmental impacts should be kept to a minimum where possible. Instead, we want to encourage you as developers and implementers to explore how you can use digital technologies to reduce the environmental impact of agricultural production (e.g., more efficient, and effective use of agricultural inputs; adaptation to climate variability). We recommend you consider all these factors in your FTF activity and while designing your digital solution. Responsible design, when integrated into inclusive design processes, offers a framework for this. Responsible design encompasses inclusion but adds dimensions like anticipation, reflexivity, and responsiveness:

- **Anticipation**: Collaboratively defining social, environmental, and economic scenarios for a digital solution, identifying potential outcomes and impacts.
- **Reflexivity**: Encouraging stakeholders to reflect collectively on the activities, assumptions, and commitments leading to these outcomes and impacts.

- **Responsiveness**: Adjusting the shape or direction of the digital solution based on these reflections and insights.

By adopting responsible design principles, you can ensure that digital technologies not only meet the needs of users but also consider possible unintended consequences for society and the environment. This promotes ethical and sustainable digital development. The Nano Ganesh case below in Case Study Box 2.3 provides a real-life example of how adopting these principles helped to develop a solution that caters to the needs and preferences of more and more users.

Case Study Box 2.3

Catering to User Readiness: Nano Ganesh's Responsible Design Process Based on Consistent Monitoring and Evaluation

Nano Ganesh, developed by Ossian Agro, provides crucial support for rural producers in India through a remote control water pump system which helps save time and resources while preventing wastage and soil degradation. Rural producers often encounter difficulties when it comes to personally managing irrigation. Operating remote water pump systems necessitates frequent trips through challenging and sometimes hazardous terrain. This process is often time and cost intensive. Consequently, many producers tend to neglect the daily management of their pumps, resulting in the squandering of both water and electricity, as well as causing erosion and soil degradation.

To counter this challenge, Ossian Agro introduced Nano Ganesh as a mobile solution for remote agricultural irrigation automation. This innovative technology allows producers to virtually control their water pumps from any location and provides the ability to monitor power levels and the pump's on/off status.

How does the solution design responsibly, following the principles of anticipation, reflexivity, and responsiveness?

Nano Ganesh provides a simple solution to producers which is frequently adapted to user's skill levels and preferences through a monitoring and evaluation strategy. The effectiveness of this iterative design process can be seen across the principles of anticipation, reflexivity and responsiveness.

Anticipation: Anticipating digital literacy divides, Ossian Agro employed technicians to support producers across varying skill levels.

Reflexivity: Ossian Agro has adopted an open feedback system among the various stakeholders across the country, based on questionnaires which are delivered by local actors. Responses are used to measure a range of information from crop patterns and irrigation requirements to literacy and cellular connectivity levels among users. These responses inform updates to the solution.

Responsiveness: After working for more than six months in Punjab state, Ossian Agro found that the producers preferred to receive the product installation training in the Punjabi local language (though they spoke Hindi). In response, installation videos were created in four languages: Punjabi, Marathi, Hindi, and English.

Catering to User Readiness: Nano Ganesh's Responsible Design Process Based on Consistent Monitoring and Evaluation

Aligning with the principles of anticipation, reflexivity and responsiveness, Nano Ganesh developed a solution which caters to user readiness and producers' varying preferences across different contexts around India.

Methodologies and useful resources

Module 2 closes by providing you with a range of suggestions for hands-on methodologies that can be used for each phase in the inclusive design approach. The selected methods outlined in Table 2.2 are particularly suitable for low resource settings and many of them can successfully be done with people with lower literacy levels. For each suggested method we provide a brief description, in addition to a hyperlink to a resource where you can find more detailed instructions about the methodology.

Table 2.2: Suggested Methodologies For Each Design Phase

Understand		
Empathize		
1. Design challenge framing (p. 33 in this guide provides a list of guiding questions) A critical activity to (1) formulate a clear design challenge with a properly defined scope and (2) ensure that everyone on the design team agrees with the challenge and is motivated to tackle it. A central question to answer in a design challenge exercise is: Does my challenge drive toward ultimate impact, allow for a variety of solutions, and take into account context?	2. Stakeholder analysis mapping (see page 12-15 of this toolkit for more information on why and how to conduct a stakeholder analysis) The best way to identify who is likely to be positively or negatively affected by the FTF activity, specifically due to the digital intervention, and assess the role that 'stake' plays in your Activity: What are the power relationships between different actors? Who decides? Who owns? Who governs? Etc.	3. RAAIS (Rapid Appraisal of Agricultural Innovation Systems) Once the design challenge and stakeholders are known, this methodology may be suitable for a first participative activity in which diverse stakeholder groups are asked to actively participate in unraveling interconnections between the design challenge, the broader (agricultural) innovation system and diverse stakeholders in the system and identifying first ideas for solutions.
4a. Personas A low-cost method that invites people to empathize with diverse participants who are the intended users of a product or service. Personas can also be used in participatory methods, inviting users to develop personas for their intersectional identity or verifying the accuracy of personas with users. 'Personas' can go hand-in-hand with 'a day in the life' and 'user journey' exercises	4b. A Day in the life of… An activity that can be done together with users, that is low cost, requires very little material resources, and does not require literacy from users. Goal is to obtain a comprehensive understanding of a user's typical day and the activities during that day. The result is more insight in the needs, demands, and aspirations of a user, and an overview of when, where, and how a user may	4c. User journey mapping An exercise that helps to visualize the process through which a user goes to achieve a certain goal (e.g., finding and obtaining the right type of fertilizer, selling agricultural produce on the market), that can help to a user's tasks, pain points, emotions, good and bad experiences, interactions with other actors etc.	5. User readiness questionnaire (see Activity 2.4) A broad assessment of different users' readiness to engage with digital technologies that is based on the 6 As that can help the design team to think up solutions that 'fit' and therefore have a better chance of adoption and scaling.

	interact with a digital solution.		

Understand

Define

1. Participatory visioning/story boarding (p. 113-117) Two methods that can be complementary. With participatory visioning the design team engages with users to develop a joined vision of e.g., how an inclusive digital solution may be used, how it will help to solve the design challenge, what offline benefits will be accrued from it, etc. Through story-boarding the vision can be made more concrete, becoming clearer on the actual design of the solution (i.e., specific hardware and software that could be used), points of interaction between the solution, users, and other stakeholders, and user experience, all leading up to ideas for prototype solutions. Both methods can be done with advanced materials, in its simplest form pencil and paper are enough.	2. Collage making (p. 61-63 of this guidebook gives a full description) A method that is very visual and creative and that can be done by anyone, regardless of their literacy level. It's a suitable method to work with vulnerable groups who may otherwise not be heard, and to delve into a specific theme of interest. Collaging works best when people are given a clear prompt or question (e.g., How would you use digital technologies if you had full autonomy over your life as a woman?). Through a collage exercise the design team can get more insight into deeper norms, values, spirations, and needs of users that would not be shared in an interview or focus group.	3. Resource flow (p68-69 of this guidebook gives more information) A method to gain deep understanding about user's financial awareness, income and revenue streams, and decision making about allocation of resources that can provide critical insights about current resource flows, providing entry points for e.g. the what type of digital solutions are economically attainable for users, demands for specific financial services, challenges and opportunities for profitable business models etc. which can all become critical features to consider in the prototype design.

Explore

Ideate

1. Card sorting Card-sorting is a low-cost method to identify people's needs, preferences, likes, and dislikes, including the reasons behind this. Because this is a visual method, it is very suitable to use in contexts where (some) users are illiterate or low literate.	2. Mind maps An activity that can be done both individually or plenary, for example on a flipchart or (online) whiteboard and with diverse objectives. A useful way to use a mindmap in the ideate phase is to identify the design features of a digital solution. A mindmap can also be a tool to map points of contact, expected interactions of a solution with the digital ecosystem, existing digital solutions and how they are used etc.	3. Extremes and mainstreams (p. 49-50) Not specifically one exercise, but a prompt to develop a solution that will work for as many users as possible by considering the needs and demands of both the most extreme and the most mainstream users. Extremes and mainstreams can be considered when selecting people to participate in a design workshop, or interview, inviting people with diverse intersectional identities including the most extreme and the most mainstream, Designers also want to consider extremes and mainstreams in the prototype design in the next phase: Whom is most likely benefitting from a particular prototype? Or perhaps you want to already consider extremes and mainstreams for the activities 4a-c in the define empathize phase.

Prototype

1. Participatory visioning/story boarding (p. 113-117)
The visions and storyboards that were developed in the define phase are very useful products to use as input for designing prototypes in this phase (preferably together with users). Perhaps the visions and storyboards have to be adapted based on the insights obtained in the ideate phase. Are the vision and the storyline for the digital technology and the solution still the same? If not, what has changed? If a mindmap with design features was developed in the ideate phase, this is the time to evaluate how these fit in the vision and storyline.

2. Rapid (paper) prototyping
When starting with prototypes there are often still many competing ideas to try out. To save time and resources it is best to start with low fidelity prototypes. These can also be made by users, e.g., drawing them on paper, reflecting specific demands, or helping a user to clarify an idea when the user is not able to do this with words. Rapid prototyping helps to quickly gain participation, try out ideas, and reduce the number of options.

3. Ranking or voting
Is a method that can be useful at many points in the design process, helping with decision making processes, finding out what users prefer or find more important, selecting prototypes, etc. Any person can participate in a ranking or voting exercise, if they have been given the information, they need to make informed choices about ranks and votes. If ranking or voting is done plenary a facilitator needs to be wary of the influence of power relations on voting and ranking behavior, the same counts in contexts with a high chance of socially desirable response.

4. Wireframes up to high fidelity prototypes
Relevant activities when designing new software (applications) or adapting existing ones. Depending on their quality they give more or less information about the user interface, and user experience, and can be tested with users who can provide feedback on the design. More advanced prototypes, which are digital and interactive and can be used on a device, allow for in depth use tests that bring usability issues to light. The more advanced the prototype the more resource intensive it will be to make it.

Materialize

Test and iterate

1. User experience evaluation
A way to test a pilot in real life and obtain feedback on a user's experience with the product. There are existing protocols for user experience (and usability) tests like this one or this collection.
Interviews and focus groups are additional suitable methods. A lot of information can also be obtained from observing users while they use the prototype, including insights that a user may not report on when asked about it, e.g., because they do not feel comfortable to report it, or they are not aware of an issue.

2. Usability evaluation
Goes hand in hand with user experience evaluations but is more focused on how user friendly a product is. Also, in this case there are existing methods, often in the form of surveys. Observations can again be very complementary to the feedback provided in a survey, during interviews, or in a focus group.

3. Use cases
A method that can be used to organize data gathered through user experience and usability evaluations and interactive feedback sessions and develop understanding about strengths and weaknesses of the current design, and opportunities to improve it.
Developed use cases are very good illustrations of a digital technology and its outcomes and impact in practice and can easily be shared with a broader audience (for example in an interactive feedback session).

4. Interactive feedback sessions with stakeholders and partners
Results from prototype testing and

5. 5Q approach
An approach that was developed to perform a quick-scan of the outcomes

6. Rapid inclusivity assessment
Methodology with a worksheet that designers and implementers can use

user experience and usability evaluations may be shared beyond the design team with other stakeholders. On the one hand this is a means to exchange experiences and share knowledge, and on the other hand a chance to gather feedback from stakeholders and evaluate with them how the prototype may be improved.	and impact of a digital intervention based on 5 carefully formulated questions. A useful method to quickly obtain initial insight in the successfulness of an Activity without the need to invest large (human) resources.	to quickly assess how different intersectional users interacted with a digital service, what motivated the users, what challenged them, and what can be improved in the design to make it a better fit for this intersectional user. Good method to identify how an activity has been received by and impacted diverse intersectional users and which pain points need to be addressed to improve inclusivity.
Implement		
1. Scaling Readiness A comprehensive approach developed for FTF contexts that facilitates the process from developing a novel (digital) innovation, to successfully piloting and testing the innovation, to scaling it. Central to scaling readiness is the understanding that an innovation never scales in isolation from other changes, and the method helps to unravel the interconnections and interdependencies. Most likely performed by the design team in consultation with other stakeholders.	2. GenderUp A method based on scaling readiness that can help to develop a scaling strategy that considers intersectionality and potential unintended, and unwanted consequences of scaling.	3. Business model canvas Well-known methodology to guide product or service developers and owners, and advisors to develop suitable business models for their product or service. The original method was adapted for digital development to foster more sustainable business models.

Table 2.2 provides ideas for a wide variety of methods that are a bit different than the ones commonly used in the development sector. You may have noticed that many of the suggested methods in that table were qualitative and some of them would require you to get into a creative mode, work participatorily with users and other stakeholders etc.

Although we believe that all the methods in Table 2.2 offer great opportunities to interact and create together with users and stakeholders, we also want to acknowledge the value of more traditional methods, detailed in Table 2.3. Let's give some examples of how traditional methods can add value to understanding the user experience for your FTF activity:

Table 2.3: Directions on the Use of More Traditional Methods

Surveys (baseline, midline, endline)	**Semi-structured or open interviews**	**Focus groups**	**Participant observation**
Surveys are still a great, structured way to collect data. They can be very valuable if well-constructed. Throughout the toolkit you've seen suggestions for survey questions and formats (e.g., the user readiness questions and the suggestions for user experience tests). In Module 3 you will find that we recommend conducting a baseline survey, as well as rapid assessments at regular intervals.	Interviews are a great way to collect very rich data. Interviews may be a suitable method at many points in the lifetime of an FTF activity. Think about semi-structured interviews with experts or	A true focus group is a qualitative method that allows you to go in depth with a group of people and discover things about, for example, social norms; people's (hidden) desires, likes,	Another qualitative method that is commonly used in user research and that can be very helpful to understand people's practices and behavior. Observations can also make social interactions

Whenever you choose to use surveys, try to stick to these two recommendations: ● Only ask a question if you are certain that it's a necessary question and that the response will be used. Don't bother your participants with unnecessarily long surveys, and don't make them share a lot of personal information if it is not necessary. ● Whenever possible, and if it fits with the digital capacity of your participants, digitize the survey. Depending on your specific needs and preferences, use digital services such as Open Data Kit, Ona, or Commcare in combination with tablets or smartphones for digital field surveys. Alternatively, conduct your survey via phone, either calling people or asking people questions via an app that you use in your FTF activity, social media (bots), bulk SMS, IVR or even USSD. This can save time and money, yet keep in mind that it is essential to check phone ownership and digital literacy by user groups first to ensure that you select a method that fits your resources and that gives the best chance of a high response rate.	practitioners at the start of your Activity, structured interviews with participants as a replacement for surveys, or open interviews with support actors after the digital solution has been piloted.	dislikes; people's opinions; societal tension etc. For a focus group you basically need three things: A strong protocol with guiding questions (note, they are guiding questions, not an interview list!), an energetic moderator, and a group of 5-9 people with time and interest in the theme that you want to discuss. Focus groups can be very helpful in your FTF activity whenever you want to understand the 'why' of something.	visible, which is very relevant when you consider using digital technologies for communication. Lastly, observations can make things visible that people cannot express in words, or that they are not even aware of. This is a great method for the empathize, define, and test phases of the design process.

Key Takeaways for Module 2

As you delve into Modules 3 and 4, remember these fundamental principles for designing inclusive digital technologies from a user perspective:

- **Acknowledge Diversity Among Users**: Recognize that many marginalized groups do not fit the classical innovator or early adopter profiles when it comes to digital technologies. Shift from thinking about user attitude to user opportunities, or lack thereof, to engage with technology.
- **Adopt a User-Centric Approach**: Understand that most participants are motivated not by the technology itself but by the practical problems it may solve and the tangible offline benefits it can bring. Use an approach where the user and the offline benefits they need, and desire are central. To achieve this complete a thorough User Readiness Assessment.
- **Design for the Existing Ecosystem**: Digital tools are supported by ecosystems and building upon technology that already exists and is known and trusted by communities is likely to be more successful. If possible, choose customization of existing solutions to meet the needs of diverse user groups over developing new solutions from scratch.
- **Overcome Capacity Hurdles**: Acknowledge that capacity limitations that can make participants hesitant to adopt a new digital technology. Do not underestimate the potential role of trusted intermediaries and invest in capacity strengthening of both users and intermediaries. To encourage adoption, demonstrate the immediate benefits of using the technology and consider providing intermediate incentives in cases where it takes longer before users accrue a benefit (e.g., in-kind - for example airtime or data bundles, trainings - or financial - for example discounts or vouchers for products that are relevant in the activity context).
- **Include Users in the Design Process**: Inclusive digital designs start with a design approach in which users can play an active role and hold a stake in the design process. Where possible, aim to include users with diverse intersectional identities to ensure that the digital solution can be accessed, used, and benefit as many people as possible.
- **Do not ignore sustainability and responsibility**: Concerns about sustainable business models, or potential unintended and undesired economic, social, or environmental consequences are easily ignored to be addressed only later. It is better to approach these themes with an open mind and make them integral to the FTF activity.

By grounding your design efforts in these principles, you can create digital solutions that resonate with users' needs, bridge capacity gaps, and promote meaningful adoption. Want to learn more? See our curated list of resources.

Module 3: Incorporating Digital Inclusion within Activity Implementation

With the deeper understanding of digital inclusion, intersectionality, and how to address different user group needs in digital tool design acquired from Modules 1 and 2, it's time to apply this knowledge to Feed the Future (FTF) activities. Module 3 primarily speaks to the concerns of implementing partners (IPs) yet will also be of interest to any Washington or Mission staff that are involved in activity design or management.

Beginning from a digital inclusion perspective, Module 3 guides you in integrating digital inclusion through the activity design and implementation process. In three key steps, you will operationalize digital inclusion into activities, asking: what is the offline benefit we want to achieve? What sort of an activity do we aspire to have when we incorporate a digital intervention? What programming do we need to plan for to ensure inclusivity?

Overall, the module emphasizes the need to (1) strategize for digital inclusion and (2) be open to tactical iterations to enhance digital inclusion during implementation. The Module shares different options for using the Digital Inclusion Framework to achieve this.

Box 3.1: Understanding Design

One word—design—means many things in digital development

It's important to note that "design" gets used in different ways by different stakeholders. In USAID, design typically refers to (1) activity design completed by USAID Mission or Washington staff and outlined in a solicitation and (2) the technical proposal (which details the activity design) completed by IP staff in response to the procurement, which drives the design decisions made by IP field staff (e.g., about designing digital solutions).

The technical activity design, and its iterations during implementation, is important because it must account for the different programming needs required to involve diverse participants and thereby enhance digital inclusion. Technological design, on the other hand, often refers to the design of the solution, including both the technical and functional specifications. In this case, the 'design' concept encourages execution of the understand - explore - materialize process to create a well-designed technological solution (see Module 2 for a refresher on this process). Well-designed technological solutions meet the diverse needs of users and thereby enhance digital inclusion.

In summary, whenever you use the term 'design', make sure that all stakeholders understand what you mean by it to avoid issues later on!

Incorporating digital technologies into FTF Activities

Generally, there are two pathways through which digital technologies can be incorporated in FTF programming. The first, is a true digital inclusion activity, where the objective of the activity itself may be "to increase the digital capacities of agro-pastoralists." This activity might partner with a local mobile network operator to extend service to underserved areas and deploy community digital champions to build up digital literacy and capacity of community members. The activity would have an explicit mandate to increase participants' access and digital literacy, and to ensure their awareness of the potential offline benefits from the use of digital tools.

The second, is an FTF activity where the overall objective is not related to digital development but in which digital technologies may be used as a tool to achieve the activity's objective. Consider the following activity objectives and note the wide variety of potential areas where digital tools could be applied.

- "Make safe, diverse, and nutritious foods more affordable, accessible, and desirable by consumers using an integrated, nutrition-led approach" could lead to SMS campaigns to highlight the importance of diverse foods or pre-planting advice accessible by IVR to improve crop yields.
- "Build resilient livelihoods with improved food and nutrition security, even in the face of shocks and stressors" could lead to satellite surveillance to track greenness of vegetation (i.e., crop health) to trigger community risk mitigation planning or to create a learning platform which describes off-farm opportunities.
- "Sustainably reduce poverty and malnutrition through improved performance in groundnut, soy, and orange flesh sweet potato value chains" could lead to the use of drones for pesticide applications or the creation of Facebook groups to build community knowledge-sharing on storage techniques.

In the second pathway, the focus shifts from access and digital literacy to offline benefit.[52] Since this second pathway is more common in FTF programming it is also the pathway that we focus on in this toolkit. While the choice of digital tools is many (See Module 4 for digital tools in action), they are similar in purpose: to result in an offline benefit to participants that, when scaled, achieves the Activity objective.

Table 3.1. presents examples of digital tools that can be used for specific FTF areas of interest, and what potential offline benefits this may result in.

Table 3.1: Examples of Offline Benefits when Leveraging Digital Tools for FtF

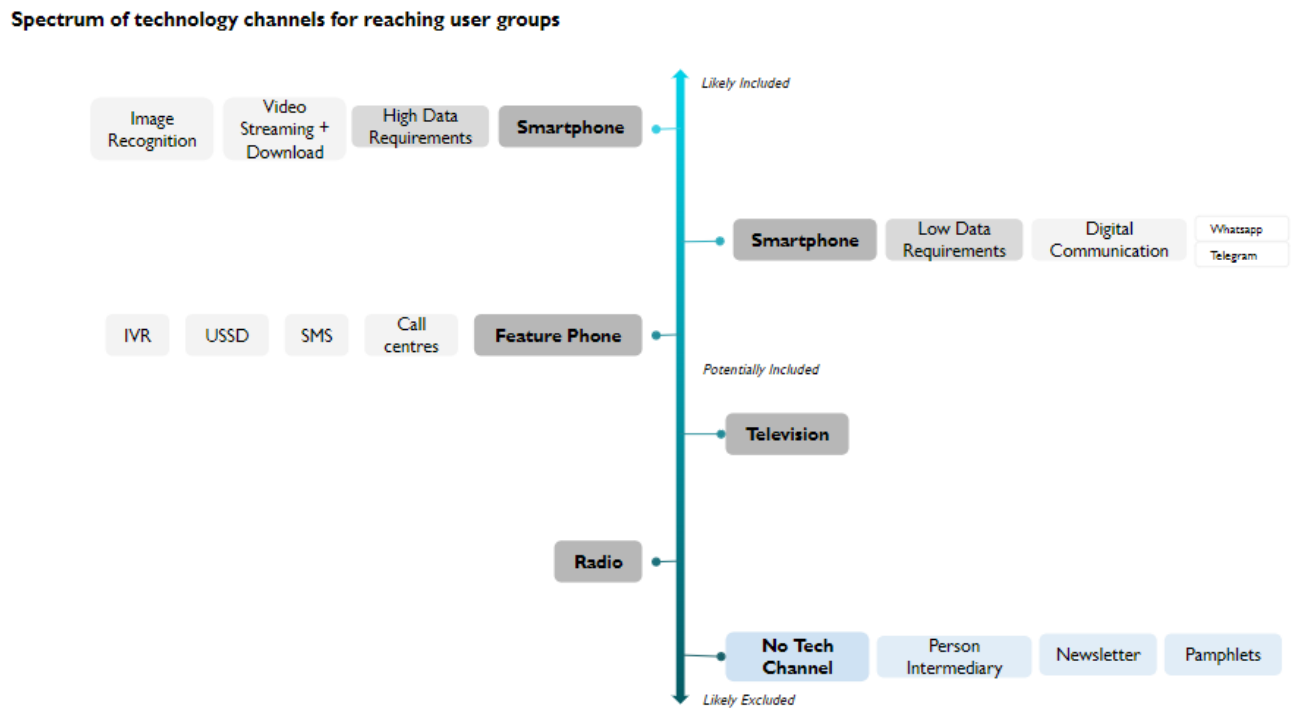
Area	Digital tools	Potential offline benefit
Enhanced agricultural practices	Mobile apps, online tutorials, and agricultural extension services.	Farmers improve crop yields, reduce losses, and enhance overall farming efficiency due to increased access to information.
Market access	Online marketplaces, price comparison apps, and SMS notifications.	Farmers increase their income and market reach by more easily connecting with buyers, negotiating fair prices, and exploring diverse markets.
Financial inclusion	Mobile banking, digital wallets, and microfinance apps.	Farmers save for future agriculture needs and access loans due to increased access to financial services.
Climate resilience	Climate modeling software, weather data analytics, and early warning systems.	Communities and governments safeguard livelihoods and natural resources by anticipating climate-related risks, implementing adaptive measures, and risk mitigation.
Nutrition	IVR systems deliver nutrition messages, SMS-based nutrition services.	Pre-literate individuals eat more diverse and healthy foods after receiving nutrition information through voice messages or tips via SMS.

In addition, the choice of *which* digital tool, or tools, to leverage has important implications for digital inclusion. Differentiating user segments, as shown broadly in Figure 3.1, by likelihood of inclusion creates a high-level understanding of what potential tool(s) may be most appropriate for your activity participants. This can then be

[52] See Module 1 to read more about the accrual of offline benefits

used as a scaffolding to dive deeper into questions of inclusion across user groups and how to best select digital solutions and design supportive programming to meet their needs.

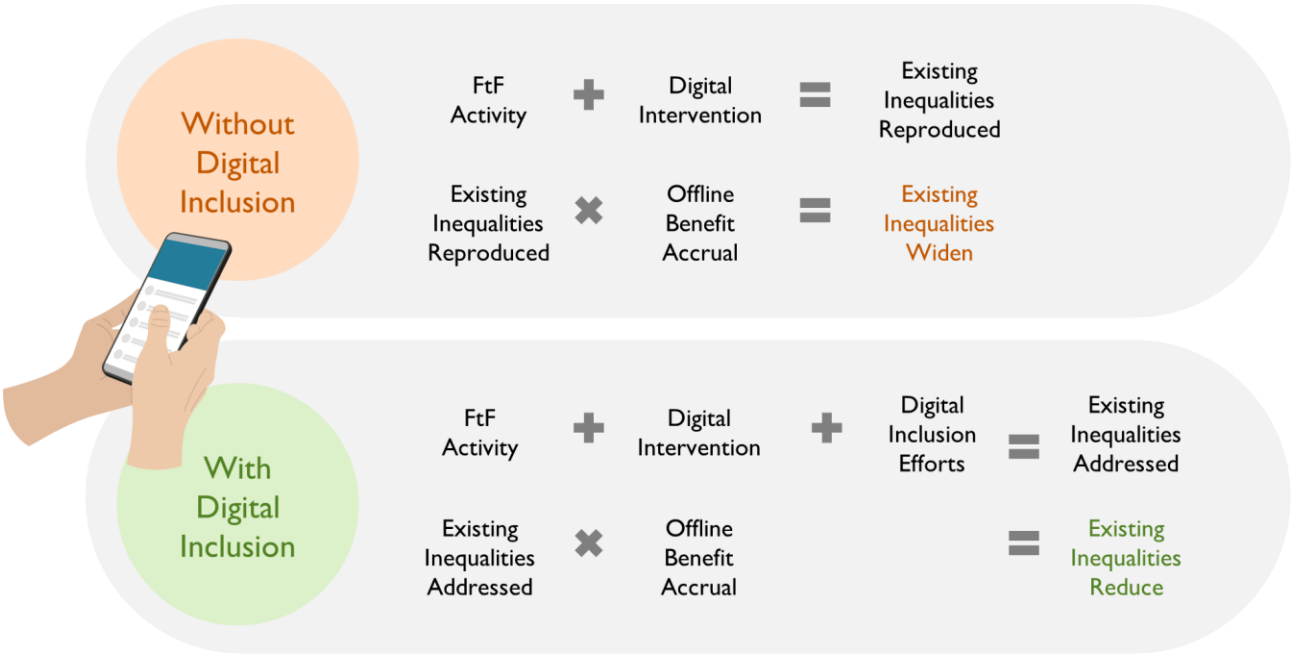
Figure 3.1: Differentiating Technology by User Likelihood of Inclusion



If incorporating a digital tool into your activity, digital inclusion efforts are also necessary

Designing effective and efficient agriculture, resilience, nutrition, water, and/or multi-sectoral activities is challenging, and incorporating digital interventions adds more complexity. There are no one-size-fits-all solutions.' The reality is that without concerted efforts at increasing inclusion, many digital initiatives may have the opposite effect: reinforcing and widening existing inequalities. Put schematically, Figure 3.2 outlines what is likely to occur if FTF activities do or do not incorporate digital inclusion efforts.

Figure 3.2: Schematic Representation of the Impact of Digital Inclusion Efforts on Inequalities



So, what does this mean? FTF activities that include a digital intervention need to ensure that digital inclusion is actively considered in both the activity programming and the solution design.

A focus on ensuring offline benefits for all participants will lead to digital inclusion

The goal of digital inclusion in FTF activities is to ensure that diverse groups of people can realize offline benefits in relation to the activity objectives. By taking offline benefit as your starting point and working backwards, you, as IP staff, can design programming that meets the needs of different user groups more equitably. But, as Modules 1 and 2 highlight, not all user groups are naturally equal and some groups will need additional support or resources to achieve the same offline benefit as other groups. As Case Study Box 3.1 demonstrates, using technology to alter pricing models can produce positive end user offline benefits, such as less debt.

Case Study Box 3.1

Leveraging Digital Solutions to Expand Offline Benefits: The UNTAPPED Smart-Meter

UNTAPPED and Mathira Water and Sanitation Company (MAWASCO) have utilized smart-meters and digital payment platforms to provide clean and safe drinking water while also addressing barriers leading to underinvestment in last-mile solutions. Traditional water payment models based on post-consumption invoices often leave low-income consumers with large, unaffordable bills and an inability to manage payments. These models present challenges for users earning income in sectors with unpredictable income patterns, rural and peri-rural areas are often disproportionately affected given their reliance on the farming sector. These areas have remained underinvested as improving water distribution has typically been viewed as an unviable business venture. To tackle these key issues, UNTAPPED and MAWASCO ran a proof-of-concept project in Malindi, a coastal town in Kenya with a population of over 300,000 installing

Leveraging Digital Solutions to Expand Offline Benefits: The UNTAPPED Smart-Meter

6,500 Pay-as-you-Go Smart meters on an 18-month capital lease. These smart-meters are linked to digital payment platforms that allow customers to make micropayments in advance for water services, while guaranteeing revenue collection for water service providers.

What are their pre-existing abilities to access, engage and benefit from the digital solution?

The UNTAPPED Program is built on an existing digital solution which uses familiar mobile payment infrastructures to align with pre-existing abilities and ensure offline benefits for all users. UNTAPPED utilized a CityTaps solution called CTSuite which combines a smart and prepaid water meter with an integrated software management system that processes pay-as-you-go payments through mobile money. Users are able to use mobile money to credit their 'water balance' for any amount, at any time and with any type of phone. Crucially, the CTSuite complemented Malindi's digital ecosystem as mobile payment platforms have a high familiarity scoring in Kenya. To ensure users within a range of digital literacy levels were also able to engage and benefit from the UNTAPPED solution, local operator training and on-the-ground support were a key program activity to ensure success. Local operators ensured that all stages of design and implementation from planning through to maintenance were undertaken using best practice and supported pre-existing abilities. The successful uptake in the Malindi pilot evidenced CTSuite as a low-risk way for new subscribers to reconnect to utility networks and make small daily micropayments to reduce their debt.

In what ways does the project successfully focus on offline benefits for users?

By utilizing technologies which were supported by the digital ecosystem in Malindi, UNTAPPED was able to successfully showcase CTSuite as a viable solution for water distribution in underinvested communities. Overall, the UNTAPPED project enabled greater access to clean water in Malindi while creating a viable business model which can boost investor confidence in relation to the last-mile market. During a three-year period, MAWASCO not only managed to collect overdue bills and reduce operating expenses but also successfully met their equipment lease payments. In addition, the cash flow processed through the UNTAPPED Digital Payments Platform was 5.4 times greater than the lease payments.[53] From a user standpoint, 98% have said they would recommend CTSuite to a neighbor, highlighting how the solution successfully provided offline benefits to users by catering to digital familiarity and readiness.[54] This was achieved by utilizing digital infrastructures users were comfortable with, in this case mobile payment platforms and setting up on-the-ground support mechanisms to address digital literacy issues. When Research 8020 evaluated the impact of the water solution for users, 89% of users said it was easy to pay by phone. UNTAPPED have since expanded their metering services across Kenya and by 2021 had added an additional 550,000 customers.[55]

[53] Global Infrastructure Hub. 2020. *Last Mile Water Provision in Developing Countries*. Available online.
[54] Ibid.
[55] Ibid.

Box 3.2: Understanding Mission resources and providing guardrails for digital inclusion in solicitations

Is your Mission interested in designing FTF activities with digital inclusion? The best place to start will be to understand the mandates, research, and staff resources at your Mission.

Does the Mission have a Gender and/or Inclusive Development Mission Order?
If so, it can be helpful to hook into these mandates to drive broader staff interest and attention to digital inclusion. Creating a core team for activity design where several staff are committed to incorporating social and digital inclusion creates a strong foundation for success. However, ensure that one person remains responsible for driving digital inclusion.

Has the Mission completed a Digital Ecosystem Country Assessment (DECA) or Digital Agriculture Ecosystem Assessment?
These new research publications outline the existing digital ecosystem in each studied country or region and can serve as recent research on the state of digital divides, digital literacy, affordability, and connectivity. With respect to marginalized groups, DECAs provide information on digital rights and digital repression. And, relevant to desired offline benefits of many FTF activities, the DECA publications pay close attention to digital financial services, e-commerce, and digital trade.

Does the Mission have a Digital Specialist? Inclusive Development Specialist? Gender and Social Inclusion Advisor?
These are all key Mission staff that, together, can help you to understand the landscape in which digital inclusion needs to occur. If you're not sure if these positions exist at your Mission, inquire with the Program Office.

What other sources could you use to understand the state of digital inclusion in the country?
Explore external resources such as publications by the International Telecommunication Union (ITU), which collects statistics on information and communication technology (ICT) use and houses the Universal and Meaningful Connectivity Dashboard; Demographic and Health Surveys (DHS) now track men's and women's internet use and women's use of mobile phones for financial transactions using nationally-representative sampling; GSMA provides up to date global, regional, and country statistics and data on the digital economy; and the Agriculture in the Digital Age study includes an Evidence Gap Map which links to additional resources.

Potential language to include in solicitations:

- Bidders/applicants are welcome to suggest digital solutions to assist in achieving the high-level outcomes/results. But if digital interventions are included, applicants must specify digital inclusion efforts. Digital inclusion efforts should be detailed within programmatic decisions, e.g., digital literacy training, as well as within the technical solution design, e.g. due to low smartphone ownership in the countryside, USSD is a likely best-fit to drive participation amongst participants.
- Bidders/applicants should outline and specify the unique needs of different user groups to ensure their inclusion. This should include statistics and/or descriptions of the digital landscape in-country with respect to availability, affordability, awareness, abilities, and agency for different user groups, paying particular attention to the intersections of gender, youth, location, and education levels. Further, bidders/applicants should be invited to describe the potential offline benefits due to the digital intervention.
- If a strong digital intervention in the activity is explicitly envisioned/requested:
    - ❖ Mandate that the technical proposal provides a digital inclusion plan, relevant indicators with a focus on user groups, disaggregated, and offline benefit, and allocates budget accordingly.

- ❖ Require that key staff demonstrate experience in digital inclusion or consider listing a Digital Inclusion Specialist as key staff.
- ❖ Reward bidders that take digital inclusion seriously by allotting it evaluative criteria.

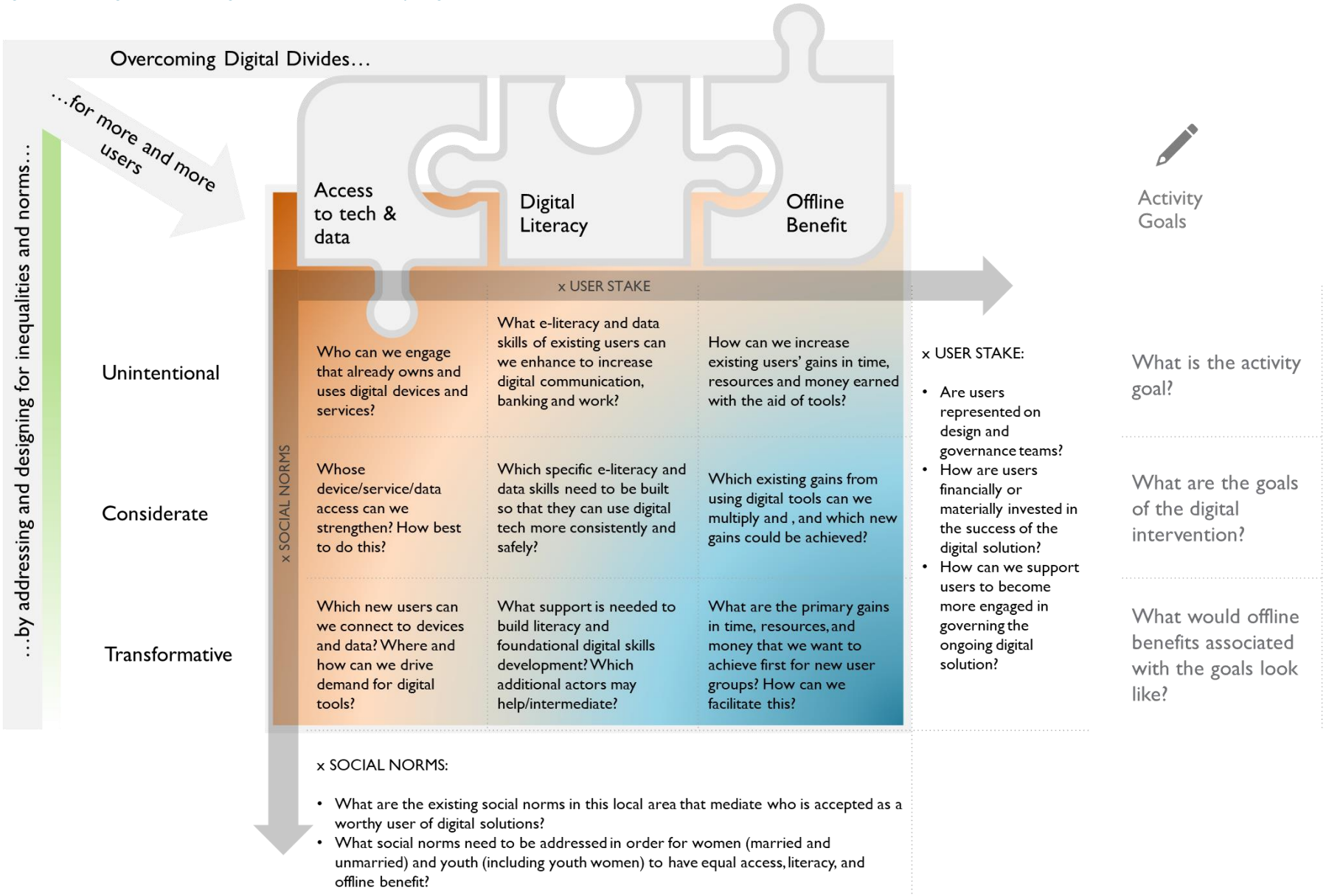
Designing for inclusion: What kind of an activity do you want when it comes to digital inclusion?

Thus far, the Digital Inclusion Framework has served as a conceptual tool to assess activity participants' ability to engage in FTF activities with digital intervention(s). For this module, we've adapted the framework slightly to directly invite activity staff to consider their approach to digitally inclusive programming–using the Digital Inclusion Integration Continuum. The continuum serves two core functions. It helps staff determine: (1) which kind of activity they aim to create—one that is unintentional, considerate, or transformative with respect to digital inclusion–and (2) programming choices accordingly across different user groups. The continuum is adapted from the Interagency Gender Working Group's (IGWG) Gender Continuum and revised for digital inclusion.[56] Rather than referring to the likelihood of inclusion or exclusion for users (as in Module 1), one dimension of the framework now highlights the features of unintentional, considerate, or transformative activities, see below for additional details.

As shown in Figure 3.3, the Digital Inclusion Integration Continuum is now populated with questions that, through answering, provide the broad sketches of digital inclusive programming. The questions prompt a consideration of what type of person is reached, and how programming could support their involvement (taking into consideration access, digital literacy, and offline benefit). By taking such a high-level approach, activity staff can begin to strategize for digital inclusion across the diversity of their participants and CORs may use it as a management tool with partners.

[56] The Gender Integration Continuum. (n.d.), Interagency Gender Working Group. Available online.

Figure 3.3: The Digital Inclusion Integration Continuum to Identify Program Needs



Below, the characteristics of activities that are unintentional, considerate, or transformative in their approach to digital inclusion are detailed. Keep in mind that any efforts to iteratively move away from an unintentional approach is welcome while acknowledging that a transformative approach within an FTF activity must be supported by a strong budget.

- **Unintentional**: Activities knowingly or unintentionally accept, and thereby reinforce, existing social inequalities and stereotypes around digital use in pursuit of activity outcomes. This approach can be harmful and can undermine the objectives of the activity. Without attention to digital inclusion, unintentional activities will likely widen gaps in offline benefit accrual. Offline benefits are then unlikely to accrue broadly but rather reach a select few.
- **Considerate**: Activities acknowledge existing social differences and inequalities to achieve activity objectives via digital tools, attempting to reach and engage user groups who are potentially, but not likely, included. This approach may result in short term benefits to users and progress toward desired activity outcomes for broader user groups than unintentional activities. Yet, it fails to significantly reduce or shift existing social inequalities that determine who is allowed and enabled to use digital tools and experience offline benefits. As a result, considerate activities introduce digital solutions into existing dynamics, without altering those dynamics in meaningful ways that shift and change who can normatively and materially benefit from digital access.
- **Transformative**: Activities aim to transform existing social relations to promote equity of offline benefit from digital tools while achieving activity objectives. This approach attempts to promote digital equality by:
    1) fostering critical examination of digital inequalities and the social roles, norms and dynamics that create these inequalities,
    2) recognizing and strengthening positive norms that support digital equality and an enabling environment,
    3) promoting the relative position of disadvantaged and marginalized user groups, and transforming the underlying social structures, and broadly held social norms that perpetuate their relative digital disadvantage.

Although it may not be possible for all activities to take a transformative approach due to limitations of scope and/or budget, all activities are strongly encouraged to adopt a considerate approach as a baseline, while striving to be transformative where possible.

Read Case Study Box 3.2 to learn about how Rays Microfinance moved from unintentional to considerate and even incorporated transformative elements into their programming. CORs may utilize both the Digital Inclusion Framework and the Digital Inclusion Integration Continuum to proactively manage IPs for digital inclusion during start up and implementation.

Activity 3.1

Brainstorm digital inclusion in 15 minutes

Using the Digital Inclusion Integration Continuum, recall a past or current activity you have worked with, spend five minutes envisioning the programmatic differences between an unintentional, considerate, or transformative approach.

1. Who are your core user groups and why?

2. What outreach strategies would you use for each user group? Why choose these strategies? Who is likely to be missed, or not aware of the activity?

Brainstorm digital inclusion in 15 minutes

3. What sort of onboarding process to the digital tool would you need to provide to users?
4. What abilities do users already have and what capacity, if any, would you need to develop?
5. What might be the challenges for users to turn participation into offline benefit?
6. Generally speaking, how much time, budget, and staff resources would be needed to provide necessary support?
7. What are programming ideas you have, to address the above issues?

Box 3.3: What do unintentional, considerate, and transformative activities look like in practice?

Achieving digital inclusion is hard! It requires activities to take a clear and concerted stance to address existing inequalities. Below are some characteristics commonly seen in each approach. It is important to note that movement from unintentional to transformative is a continuum and any effort to advance toward transformative is welcome. Activities are strongly encouraged to adopt a considerate approach and incorporate transformative elements as timeline, budget, and participant feedback allow.

Unintentional	• Reaches relatively advantaged user groups who are likely included • Reinforces existing inequalities and norms around digital tool use • E.g., Activity does little to no outreach and only urban, wealthy, educated men who already have and use smartphones benefit from a supply chain platform to link buyers/sellers
Considerate	• Reaches disadvantaged user groups who are potentially included • Works around existing inequalities and norms around digital tool use • E.g., Activity realizes that women are less likely to have an email address, which was their first recruitment strategy. They utilize phone numbers instead and can reach rural, married women and target them for nutrition-only content through SMS messaging.
Transformative	• Reaches marginalized user groups who are likely excluded • Fosters critical examination of existing inequalities and norms and creation of new norms, roles, and behaviors around digital tool use • E.g. An activity does sensitization with parents on importance of digital access and rural, poor, pre-literate, youth women are allowed to use family feature phones. After completing a digital literacy training, they access off-farm livelihood mentoring via SMS.

If, during implementation of an activity, you find that many of your participants in the digital intervention were already likely to be included, reconsider the diversity of user groups, and make course corrections accordingly to become more inclusive.

Case Study Box 3.2

Pivoting to More Inclusive Design Choices: The Case of the Ethiopian Rays Microfinance Moving from an Unintentional to a Transformative Solution

Rays Microfinance (Rays MFI) has developed a smartphone application with the purpose of expanding access to modern financial services in both rural and urban communities within Ethiopia's Somali Region. The leadership at Rays MFI noted a thriving trade culture in the Somali region, coupled with an awareness of technological advancements. The potential for trade and small businesses, however, is constrained by a lack of available financing opportunities. The Somali region predominantly adheres to Islamic beliefs, which come with specific requirements for accessing financial services. This can discourage microfinance institutions (MFIs) from developing solutions in this area, leading to a scarcity of available services. Notably, there is a significant presence of women in the trade sector, with many taking the lead in establishing small businesses because of their pastoralist activities. As a result, the limited financing options disproportionately affect women, especially in terms of growing and expanding their businesses in this region. In response to this critical need, Rays MFI introduced a smartphone platform that focuses on two vital services: mobile money and Islamic financing, known as Murabaha.[57]

How was the solution initially unintentional to user needs?

Initial participation in Rays MFI's mobile financial services was limited, especially among pastoralists who are typically spread out in rural, lower-lying areas. To address the platform's low adoption, a pilot program was conducted in various rural and urban settings to gauge the platform's response. While people were generally open to it, a critical issue arose: most pastoralists used basic feature phones, not smartphones. According to the Alliance for Affordable Internet (A4AI), the cost of a smartphone is particularly significant, and represents almost 97% of average monthly income in Ethiopia.[58] It is therefore unsurprising that only 12% of women in Ethiopia own a smartphone with figures likely to be significantly lower in rural and peri-rural areas.[59] Given that the majority of Rays MFI's features had been developed to function on smartphone and tablet devices, limited smartphone ownership created a significant barrier to engagement. Various solutions were explored to address this issue, including kiosks for loan applications and cash dispensers. It became apparent, however, that limited understanding of the financial system, coupled with nascent digital literacy of pastoralists, was also a major obstacle to meaningful involvement. At this juncture, the smartphone solution alone was deemed unviable.

What changes were made to create a more considerate solution?

Rays MFI tackled the challenges of limited smartphone access and digital literacy by deploying agents armed with tablets and smartphones to assist pastoralist communities. These agents are typically tech-savvy young graduates who are well-versed in the necessary technologies. The selection process for agents extends beyond technical proficiency to encompass cultural sensitivity, familiarity with the community, and their reputation for trustworthiness in the areas where they work. Once chosen, these agents undergo specialized training, provided by Rays MFI, focusing on overcoming digital and financial literacy challenges. They

[57] **Murabaha** is a type of Islamic financing arrangement where a bank or financial institution buys an item (like a car or a house) on behalf of a customer and then sells it to the customer at a higher price. The customer then pays back the higher price in installments. It is a way for people to make big purchases without taking out an interest-bearing loan, which is not allowed in Islamic finance.

[58] GSMA. 2023. Mobile Money in Ethiopia: advancing financial inclusion and driving growth. Available online.

[59] Ibid.

Pivoting to More Inclusive Design Choices: The Case of the Ethiopian Rays Microfinance Moving from an Unintentional to a Transformative Solution

play a vital role in providing access to the Rays MFI platform by setting up kiosks in rural areas, allowing pastoralists to travel shorter distances compared to reaching a bank. The agents assist pastoralists in accessing the mobile banking solution through the provided tablets. At the same time, they are also enhancing the digital literacy of pastoralists. Following this digital design pivot, Rays MFI conducted another pilot test, using the agent-based approach which yielded more positive results. Rays MFI reported that the gender imbalance of their agents, which skewed toward men, did not negatively impact women's participation in the program. It is unclear how strong social norms dictating how opposite sexes interact were overcome to guarantee equal participation of men and women pastoralists.

What initiatives have Rays MFI embarked on to create transformative change?

Agents play a crucial role as facilitators by focusing on user empowerment rather than establishing themselves as the sole entry point to the platform. A key aspect of the agent's role is to improve user skills and knowledge, so that pastoralists can eventually use the platform independently when they own their own device. Building on the progress of pastoralists receiving digital literacy training from agents, Rays MFI has launched initial initiatives for mobile phone loans for these individuals. They offered 100-150 loans for phones with a 6-month repayment plan, and the success of this program is currently being evaluated. This approach highlights Rays MFI's dedication to not only granting access to the mobile money platform through agents but also strengthening user capabilities to access and engage with the mobile money platform independently. This ultimately reduces reliance on intermediaries.

What initial actions are needed to lay the foundation for digital inclusion?

The best way to achieve digital inclusion is to proactively plan for it. Often inclusion efforts are undermined by a lack of data to inform decision-making. Therefore, it is essential that actionable data is collected to feed into a digital inclusion plan. There are two data collection opportunities that, in tandem, provide a strong understanding of user groups and the social dynamics they operate within: the User Readiness Assessment (detailed in Module 2) and the activity-level Gender and Social Inclusion Analysis (see additional details below). The User Readiness Assessment provides information on individual users; and their current state regarding the 6 As. This information gives useful entry-points regarding the desired functionality of a digital solution. Meanwhile, the Gender and Social Inclusion Analysis provides information on the social dynamics in which users live; ascertaining how these dynamics and norms moderate their ability to use digital devices.

If you are confident that a digital tool will be part of the activity, during start up:

1. Complete the User Readiness Assessment in Module 2.
2. Adapt the Gender and Social Inclusion Analysis to include the social dimensions of digital tool use in your Zone of Influence (ZOI).

If you might incorporate a digital tool over the course of the activity, but do not know for sure yet:

1. During start up, adapt the Gender and Social Inclusion Analysis to include the social dimensions of digital tool use in your ZOI. Keep in mind that there may be strong differences between regions.
2. When the decision has been made to incorporate a digital tool, complete the User Readiness Assessment in Module 2.

To assist in leveraging the Gender and Social Inclusion Analysis for digital inclusion purposes, Table 3.2 suggests questions to incorporate across the 6 domains.[60] Please note this list is not comprehensive and is meant to serve as inspiration. It should be modified to fit the context and particular digital tools you are considering.

Table 3.2: Bringing digital inclusion into Gender and Social Inclusion Analyses

Domain	Questions to incorporate digital inclusion
Laws, policies, regulations, and institutional practices:	• Are there any existing laws or policies that prohibit anyone from owning and using a digital device? • Are there any existing laws or policies, such as tariffs, that impact the affordability of digital devices or services? • Are there any existing laws or policies that make using digital devices a potential risk or harm to any groups?
Cultural norms and beliefs	• Who is socially allowed to use a digital device? • Are family members sharing a device or own personal devices? Who is more likely to share their device with others? • What are the social norms/assumptions around why people use devices? Are any of these norms prohibitive to some people but not others? Are there any negative associations with device use for some people?
Roles, responsibilities, and time use	• Who is typically responsible for registering the digital device? • Who typically carries the device with them throughout the day? And why? • Who has the time to engage with the device? • Who has a digitally literate social network that can help support the user's own digital literacy?
Patterns of power and decision making	• Which family members get to determine how that device is used and by whom? • Which family members have the authority to make decisions over the use of the digital device?
Access to and control over assets and resources	• Which family members own a digital device? Are there differences in the quality of the device (cracked screens, poor battery life, etc.) of different family members? • Which family members have the financial and time resources to regularly charge and use the device? • Which family members have the financial and time resources to regularly load and use data?
Personal safety and security	• For whom might interactions online generate new forms of harassment, security risks, and/or emotional strife? • For whom might digital devices open new forms of digital tracking that could expose them to harm? Consider gender-based violence. • Who is (un)likely to access cyber security, privacy, and safety training?

What do we do with the data collected?

One tactic for discerning upcoming activity needs with the information gathered is to separate out which information should inform solution design versus programming. In general, information on device ownership, internet connectivity, and basic literacy and numeracy creates the baseline for designing the digital solution, which can then be complemented by taking other data points into account. Information on digital literacy and social norms typically informs activity programming, though be sure to include programming on availability and affordability as needed. See Table 3.3 below for additional details.

[60] ADS 205 outlines 5 Gender Domains which are commonly used, whereas Inclusive Development guidance adds the 6th domain of personal safety and security. This domain is likely of increasing importance in digital spaces due to technology-facilitated gender-based violence.

Table 3.3: Checklist on Which Data to Use for Designing a Digital Solutions vs. Digital Programming

Data about…	Primarily influences…
Device ownership (availability and affordability) Internet connectivity (availability and affordability) Basic literacy and numeracy	the digital solution design
Digital literacy (awareness and abilities) Agency (including stake, governance, and data) Laws and policies on digital tools/use Social norms (social acceptability) Control and decision-making over digital devices	programming content

For each FTF activity with a digital intervention, IPs must make strategic and tactical decisions about how to incorporate these data points. Ultimately the digital interventions should aid programming and the accomplishment of activity goals. Since the digital intervention is only one activity component, discerning what is feasible is an important task. This is why baseline assessments are critical. Armed with information from these baseline assessments, activity staff can begin to answer the questions detailed in Figure 3.3. It is important to work backwards: from the specific activity goal and the sub-goals for which a digital intervention is used. Once these goals have been established, it becomes possible to formulate which offline benefit participants could realistically gain from the activity.

Notice that the offline benefit is assumed to, in part, come from using the digital tool. But to achieve this, the activity must additionally invest in programming that supports access and digital literacy. In some cases, specific training, for example on how to use the digital tool proficiently, may be necessary for all or some user groups. Beyond initial capacity strengthening and, possibly, longer term technical support, programming should be established for product awareness building, scaling, and sustainability. Read Case Study Box 3.3 to learn how the Viamo Platform leveraged interactive voice response to achieve the offline benefit of increased access to knowledge for users with limited internet connectivity.

Case Study Box 3.3

Collecting User Data to Cater to New Contexts and Preferences: The Success of the Viamo Mobile-Based Information Service

The Viamo Platform, previously known as the 3-2-1 Service aims to empower communities facing barriers to accessing information, providing them with immediate access to content via feature phones and in a language they understand. Limited internet connectivity presents a significant obstacle to accessing timely and reliable information and can lead to the wastage of scarce resources and serious health issues. The Viamo Platform operates as a mobile-based information system, offering reliable content on various topics including agriculture, weather, microfinance, health, nutrition, and gender-based violence. Users engage with the service by dialing the number (321) and follow interactive voice response (IVR) prompts to retrieve information on their selected topic. This service is designed to cater to individuals with low literacy levels or who are visually impaired, as all content is presented in audio format. The Viamo Platform is now

available in over 20 countries.[61] In Pakistan alone, the Viamo platform reached 10.8 million people with over 19 million key messages about COVID-19 during April and May of 2020.[62]

What are users' pre-existing abilities to access, engage, and benefit from the digital solution?

Viamo employed a comprehensive participatory design process to ensure the scalability of the solution while tailoring 3-2-1 messages to be relevant, understandable, and actionable for each country's unique context. When designing for a new country context, the Viamo design team began by conducting research on the successes and failures of previous deployments. They then tested critical assumptions in the target country to gauge their applicability in the local environment. For instance, an expansion team might have explored whether local callers prefer content presented in a lecture-style monologue or as a conversational dialogue. Focus groups were then utilized as a key mechanism for collecting feedback from local end users, enabling the design team to customize the content development tools and establish country-specific guidelines. In relation to evaluating content delivery strategies, focus groups provided input on preferences for the gender of the message 'voice' and the tone of the message. In Zambia, for example, monologue messaging is the preferred format, often accompanied by a tagline linking the content to an official government office, such as 'the ministry suggests'. Meanwhile, in Uganda, a casual dialogue with a relaxed tone is generally favored.

In what ways has collecting quality user data shaped the solution's success?

The Viamo platform's success can be attributed to their continuous collection of user data throughout the design and monitoring and evaluation process. Within the Viamo Platform, there is a built-in capability to monitor user statistics. This involves tracking how users interact with the service, such as the total number of calls made by each user, users' selections of topics, and whether individual users listen to key messages in their entirety. Viamo associates this data with demographic information gathered through an opt-in process. Basic details, like gender, location, and age, are recorded from those who choose to register. This information is then utilized to customize and develop content to meet user needs. The effectiveness of this approach is evident: in Madagascar, 91% of the female participants that Viamo surveyed reported that the platform's content enhanced their ability to make household decisions.[63] Additionally, 96% reported that it added value to their lives.[64] The majority of both men (98%) and women (94%) agreed that the gender equality information improved their understanding of the importance of girls' education.[65] In order to scale the solution, Viamo partners with MNOS in the countries where they are operating. In some countries Viamo has established exclusive agreements with an MNO which grants subscribers of that MNO 5 free calls per month. By incentivizing only some users of the platform, data on call volumes has the potential to be skewed to a particular group. It also means that the benefit of engaging with the platform, in the form of free calls, is only experienced by certain users and not others which limits the overall inclusivity of the approach.

[61] Viamo. 2023. *The Viamo Platform.* Available online.

[62] Viamo. 2023. *Viamo Platform COVID-19 Response.* Available online.

[63] Ibid.

[64] Ibid.

[65] Minischetti, E. and Karim, F. 2015. *Connected Women Case Study: HNI Madagascar: Information via mobile to tackle gender-based violence.* (GSMA, London). Available online.

Activity 3.2

Outlining programming needed for intersectional user groups to accrue offline benefit

Let's practice working backwards from formulating activity goals to digital intervention goals, and to formulating plans on how to incorporate digital inclusion. Only when activities create and implement activities and programming goals that match digital goals, and vice versa, can diverse users truly benefit. Consider an upcoming, current, or past activity that you've been involved with and answer the following questions:

1. What is your overall activity goal?
2. What is the specific goal that the digital tool will address?
3. Given this, what are the offline benefits you want to see manifest in the lives of the participants? Make note of this for monitoring purposes.
4. Which intersectional user groups will be most likely to achieve the desired offline benefits and why? Get to know your user groups by completing Module 2 Activities 2.1, 2.3, and 2.4. Completing these activities early on enables the needs of users to be richly incorporated into the design.
5. To achieve the desired offline benefit for other user groups, what are the access barriers that need to be overcome? How can programming be designed to address participants' access challenges?
6. To achieve the desired offline benefits for other user groups, what are the digital literacy skills that need to be developed? How can programming be designed to address participants' digital literacy challenges?
7. Circle back. Given the programming ideas that you've outlined in #5 and #6 would that result in these user groups experiencing the offline benefit you stated in #3? If not, keep iterating until you have a treasure trove of programming ideas to engage different user groups in your digital initiative that result in offline benefit accrual.

How can we use the Framework for monitoring and evaluation (M&E) of benefit accrual?

FTF activities that incorporate a digital intervention should take care to report their good efforts and hard work against the updated 2023 Feed the Future Indicators, which require second-level disaggregation for activities that are digitally-enabled for the following indicators:

- **EG.3.2-24: Number of individuals in the agriculture and food system who have applied improved management practices or technologies with USG assistance:**

  Digitally-enabled: Technologies that incorporate some form of digital technology, including software (such as databases, mobile apps, websites, artificial intelligence, blockchain, and Geographic Information System (GIS) software) and/or hardware (mobile phones, computers, radios, sensors, satellites, autonomous systems, and 3D printers). Examples include individuals using a cloud-based supply chain management system, an Internet-enabled soil sensor, a mobile app that facilitates input purchases, or pest monitoring service that uses artificial intelligence.[66]

- **EG.3.2-25: Number of hectares under improved management practices or technologies with**

[66] USAID. 2023 FTF Indicators PIRS. See EG.3.2-24. Available Online.

USG assistance:

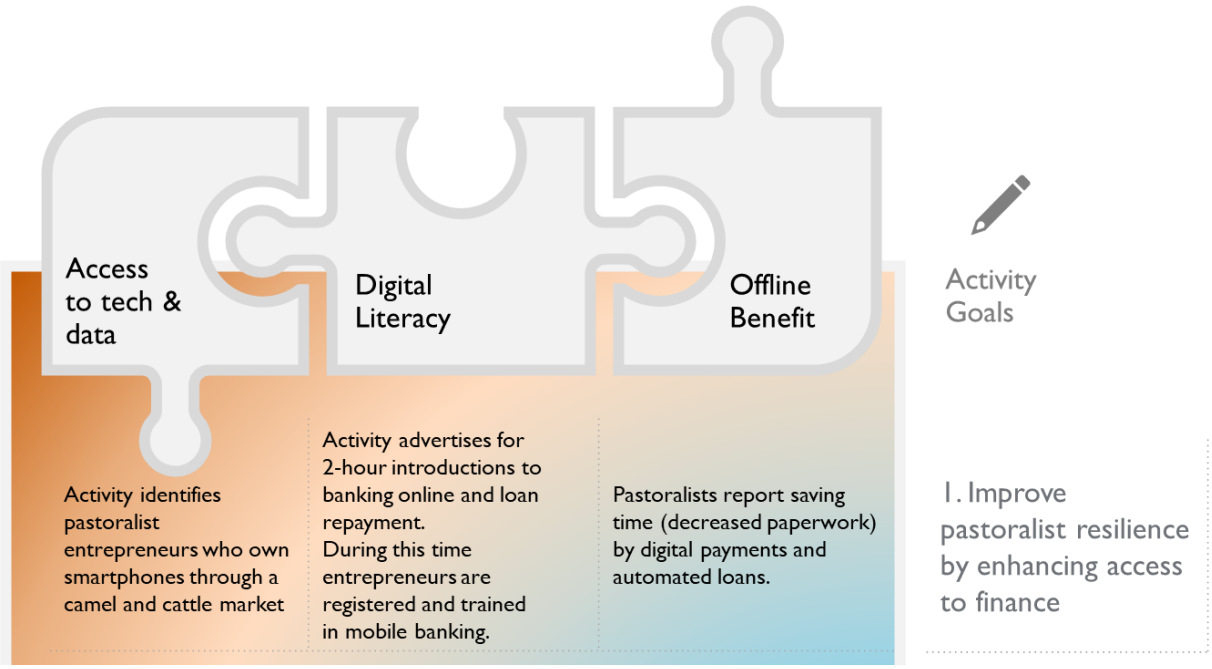
Digitally-enabled: Technologies that incorporate some form of digital technology, including software (such as databases, mobile apps, websites, artificial intelligence, blockchain, and Geographic Information System (GIS) software) and/or hardware (mobile phones, computers, radios, sensors, satellites, autonomous systems, and 3D printers). Examples include hectares under an improved fertilizer formulation based on digitally enabled soil maps, hectares with improved contour bunding based on geospatial analysis of agricultural areas (including weather, vegetation, and moisture), and hectares covered by a digitally-enabled index insurance.[67]

In addition to tracking required outputs, the framework is meant as a conceptual tool, not a measurement tool, that can provide a scaffolding for assessing progress. Tracking custom outputs, such as 'the number of people trained in digital skills' or 'the number of phones reached in an SMS campaign' capture what has been executed and can serve as monitoring data on program delivery. However, the outcome of offline benefit, when tracked for different user groups, can inspire additional learning on digital inclusivity and inspire rapid course corrections. When scaled, the offline benefit should result in a positive impact that is aligned with the activity goal.

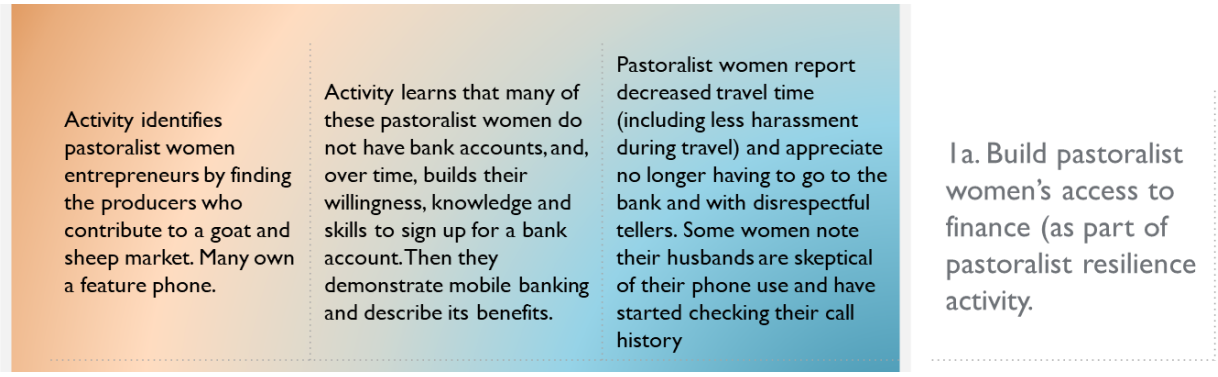
The tech sector is famous for the mantra "move fast and break things." When it comes to digital development a more fitting mantra is "move fast, learn quick, and readjust." With respect to digital initiatives, create a culture of executing mini rapid assessments to learn what is going well and where course corrections may be needed. Note that, when working with marginalized groups, qualitative assessments (such as focus groups, field observations) can often garner more meaningful insights than quantitative surveys. The focus should be on whether offline benefits are accruing to different user groups. If so, rapid assessments should focus on how they are accruing benefits and the magnitude of these gains. If no benefits are achieved, the rapid assessments should focus on identifying why this does not happen by looking for e.g., prohibitive social norms, time, infrastructural, or economic discrepancies, etc.

Below we walk through a short demonstration of how an activity might use the framework to continue their digital inclusion efforts. First, an activity determines that their activity goal is to improve pastoralist resilience by enhancing access to finance. The activity decides mobile banking is the best way to accomplish this–introducing a digital intervention. The activity begins by recruiting individuals:

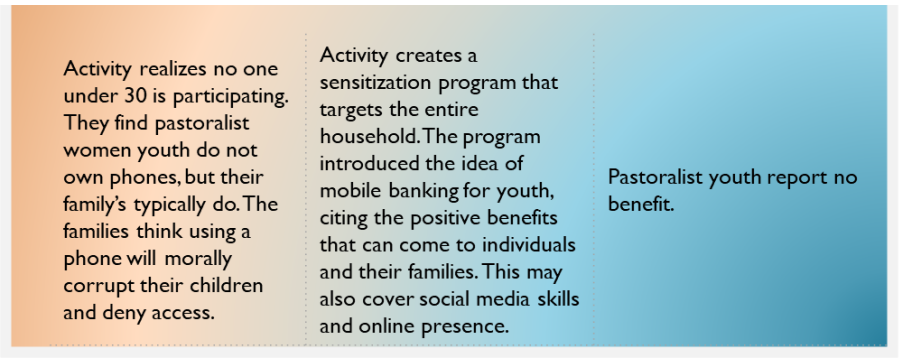
[67] USAID. 2023 FTF Indicators PIRS. See EG.3.2-25. Available Online.



Rapid learning: After the activity has been running, with success, a rapid assessment of the benefits to the pastoralists is done. The activity staff realize that all the participating pastoralists are men. In asking why, they come to realize that their recruitment strategy was gendered–gender roles in this pastoralist community mean that women do not manage camels and therefore were absent from the beginning. Activity staff work to be more inclusive, learning that women in this community manage goats and sheep but are not allowed to sell them in the market, as this is the role of their husbands:



Rapid learning: The activity staff realize that they should have done more sensitization work with husbands during recruitment, given the outcomes reported by the women. The women's gains are motivated by different concerns–they appreciate how mobile banking minimizes harassment while traveling to brick-and-mortar banks and interacting with tellers. However, mobile banking has also introduced a new dynamic into their households because their husbands are becoming more suspicious and therefore controlling. Now that the activity has better understood gender dynamics, they are eager to hit their youth-related indicators but realize that everyone involved is an adult.



Rapid learning: In working to reach youth, the activity staff realized that they had to incorporate programming to address how social norms and expectations can prevent someone's access to digital devices. Although they created programming around this, when they ran a rapid assessment on youth, they reported no benefit. In this case, the program has not yet found a way to help a particular user group–here pastoralist young women–accrue offline benefits to their digital initiative. By rapidly assessing if youth women are accruing benefit, the activity staff can learn that they need to continue to adjust programming to achieve digital inclusion.

In summary, creating rapid assessments of offline benefit is a key feedback mechanism for ensuring digital inclusion in FTF activities. A focus on offline benefit achieved via digital tools is important because digital inclusion is rarely, if ever, the activity objective. What good is a digital initiative if it doesn't improve participants' livelihoods with respect to agriculture, resilience, nutrition, climate risk, and water management?

Box 3.4: Important items to remember during implementation!

Implementation is a whirlwind of many different tasks competing for staff attention and time and activity resources. When digital inclusion is presented as the goal, it is common for some items to be pushed to the side. Below are key items to keep in mind during implementation.

Take the time, and resources needed to build strong consent procedures
Take action to ensure participants aren't pressured into digital initiatives that compromise their autonomy. Users must receive comprehensive information, via locally appropriate methods, about both the potential benefits and harms of digital inclusion. Consent garnered without participant comprehension is not consent. If users are pre-literate or low-literate, consider creating images or vocal activities that explain benefits and risks to gain meaningful consent.

Participants retain the right to opt out of digital interventions
After working hard to address different potential user group needs, it is important to respect the rights of the participants who do not want to be included or revoke consent. It is possible that participants' interest not to engage may conflict with activity interests to garner their participation. Nonetheless, digital inclusion should always be presented as a voluntary choice with the option to opt out at any time. If you experience high numbers of participants who are opting out, complete a rapid assessment to find out why this might be the case and consider ways to address the identified issues.

Right size your digital inclusion goals with your timeline and budget
Digital inclusion requires time, budget, and staff resources–not to mention commitment. Those already connected and literate represent relatively easier-to-reach populations. To promote digital inclusion, resources must be allocated equitably to help more individuals overcome digital divides, including those that are hard(er) to reach.

Consider how to leverage private sector energy and resources
Private providers of digital and sector-specific products and services can be key partners to implementing digital inclusion activities. Working with existing private providers from the outset can help to move to implementation more quickly by leveraging existing solutions, and improves the sustainability of a program where the provider has a commercial incentive to continue providing their services beyond the program. From the outset, do a mapping of providers of existing solutions in or nearby your intended user group, and consider the following points when engaging with them:

Look for opportunities where your program activities can unlock value for private partners. For example, building the literacy and digital readiness of your intended users helps to build the customer base of digitally delivered products and services. Sharing the data you collect in your user research may be valuable for private providers to conduct further product design. In return, ask to the private sector player may include providing several inputs to the program activities - such as discounted devices, access to existing agent networks or their own training resources – as combining this with the program's digital inclusion activities can expand their customer base and revenue potential.

Consider how your program can address some of the market gaps in existing digital products and service. For example, the program can contribute to offsetting the high upfront capital costs of deploying network infrastructure in new areas. Private providers may be willing to cover the ongoing maintenance and operational costs associated with these networks.

Look for opportunities to combine existing and new products and services across sectoral silos. Your program can play an integrator role in combining products and services across multiple sectors (e.g., agriculture, nutrition and water and sanitation) and deliver these services through a single digital channel or agent network. Bundling the offerings of existing providers into a single offering that best meets the requirements of different users can be a powerful approach to more comprehensively addressing users' multifaceted requirements.

Key Takeaways for Module 3

Module 3 connects the concepts of Module 1 with the practices of Module 2 as they relate to implementing an activity. As you apply the toolkit content to your activity, remember to incorporate digital inclusion efforts by:

- **Getting clear about the** different levels of design: The decision to incorporate a digital intervention commits an IP to run a mini activity within the greater FTF activity. In addition to the Activity Design (the theory of change and the programming to support it), any digital tool must also be designed (technological design) to meet the needs of the participants.
- **Staying focused on the desired offline benefit**: Digital tools are only meaningful if they produce an offline benefit that is aligned with the activity goal and that improves the livelihoods of participants. By focusing on the offline benefit, the potential program offerings that are needed to help (certain user groups) address access and digital literacy issues and to ensure benefit become clear.
- **Outlining your activity approach (Figure 3.3) to digital inclusion:** Building on the Digital Inclusion Framework for participant user groups, a slight adaptation creates the Digital Inclusion Integration Framework which outlines how activities can make programmatic decisions to be unintentional, considerate, or transformative in their approach to digital inclusion.
- **Collecting good data about participants to enable program and digital tool design**: Incorporating digital tools into an activity necessitates additional data collection to get it right. During the startup phase, activities can incorporate questions about the social dimensions of digital devices into the Gender and Social Inclusion Analysis and should budget to complete a full User Readiness Assessment. These two data sources, in conjunction, detail the needed programming and solution specifications to serve diverse user groups.
- **Making use of the Digital Inclusion Integration Continuum to assess your activity and iterate for improvement**: All activities should commit to reducing inequalities through digital initiatives, yet this can be challenging. The Continuum can be used as a conceptual tool to assess if offline benefit is occurring and for whom. Focusing on offline benefit, and for whom, can help sharpen attention to user groups who may need additional programming before they can accrue offline benefits.
- **Don't forget**: Implementation is a hectic time, remember to occasionally slow down and create strong consent procedures using locally-appropriate methods, ensure participants know how to opt out, and right size your digital inclusion dreams to fit your time, budget, and staff capacities.

By remaining attentive to the challenge in operationalizing digital inclusion into activity design and implementation, you can build activities which take clear and concerted action in addressing and designing for inequalities and norms. In doing so, you can achieve digital inclusion for more and more users. Want to learn more? See our curated list of resources.

Module 4: Case studies and constraints to implementing inclusive digital design

Having gone through the previous three modules, hopefully you are feeling inspired to start applying some of the inclusive digital design practices in your own work. However, you may also be feeling overwhelmed at the volume of information and approaches that have been provided. Perhaps you are skeptical about whether you and your team could practically implement this approach with the constraints that you face in your program. You may be thinking "my funding does not cover all of these activities," or "I need to deliver results quickly and don't have the time to incorporate this approach." This module aims to help alleviate some of these concerns by providing practical views from the field through several case studies.

You will notice that none of the case studies provide a perfect view of implementing an inclusive digital design process. All of the case studies reveal limitations, practical challenges and imperfections - some of which you are likely to face in your own work. There is an important lesson here - **implementing an inclusive design approach is often a messy, non-linear process fraught with challenges and practical constraints.** The key takeaway is to acknowledge this reality and not be disheartened if you aren't able to implement the ideal approach in all circumstances. Incorporating the elements of an inclusive design approach that you can, with the resources and skills you have available to you, is sufficient to make a start.

There are three case studies to explore in this module. Each focuses on a different aspect of the inclusive design process and reveals a similar set of constraints that implementing these approaches will face. Before diving into the case studies, the following section synthesizes the common implementation constraints and provides recommendations on how to overcome them.

Case study	Inclusive design aspects	Countries	Sector
TechnoServe's Digital Design Lab	Employing a user persona approach	Benin, Nigeria	Agriculture
Digital Green's digital advisory tool	Addressing gender norms	India, Ethiopia, Kenya	Agriculture, climate resilience
Alliance-Bioversity & CIAT's climate resilience tool	Iterative user feedback-driven design process	Colombia	Climate resilience

Constraints to implementing an inclusive design process

Although there are several constraints you are likely to face in implementing inclusive design processes, the most common constraints relate to time, funding, and information. Each type of constraint is explored in more detail below, with suggestions on how to overcome or mitigate them.

Are you an AOR or COR managing an activity with a digital intervention? It is easier to discuss digital inclusion than to implement digital inclusion. As you'll see below, implementing partners face an array of constraints to put digital inclusion into action. In your role as AOR/COR, you have a unique role to play in fostering digital inclusion on the ground.

- Be aware that digital inclusion takes time. Help IPs troubleshoot delays in delivery and, since digital inclusion often takes time due to social norms, get comfortable with some delay in demonstrated results.
- Understand that the actions needed to achieve digital inclusion will require financial resources. Generally speaking, the more inclusive an activity seeks to be, the more resources will be required. Funding requests, when well-evidenced, should be seriously considered for approval. Women, youth, and marginalized groups are the participants most likely to benefit from additional resources.
- Facilitate data collection and information flow. When dealing with marginalized participants, data is often scarce. Adopt an iterative approach and encourage IPs to complete rapid assessments to gain insight into how and why digital inclusion efforts are, or are not, successful. Lastly, consider connecting IP leadership to other IPs for digital inclusion collaboration, troubleshooting, and sharing of best practices.

Time constraints

Development programs are often under pressure to deliver impact results quickly. For example, Alliance-Bioversity has previously been challenged with needing to deliver initial outcomes on their programs within several weeks of implementation. Funders and other partners are often eager to see a solution being piloted and tested quickly. With such tight timelines, the time required to follow an intentional and user-focused phase of research and design considerations may be challenging.

The unique characteristics of the agricultural sector and its participants can also present timing challenges. Producers are very busy people and it can be difficult to engage them in co-design activities during the harvest season when they have a window of time to collect and sell their crops. The Alliance-Bioversity & CIAT team experienced this challenge as their program started around harvest time, making engaging with farmers difficult. Where programs are engaging with specific groups of users, such as female farmers, co-design processes also need to be mindful of the unique time constraints of these users. For example, Technoserve's activities targeted at female farmers in Nigeria struggled to get active participation because the workshops were scheduled at times that were inconvenient for women given their domestic and child care duties.

Recommendations to mitigate some of these timing constraints are:

- When planning user research and co-design engagements, be cognizant of the time commitment capacity of the users and work around their daily and seasonal cycles.
- Work with local partners (e.g., farmer cooperatives, local NGOs, or extension networks) that have a deep contextual understanding of the users, can speak local languages, and have already secured trusted relationships with the users to inform early design considerations and an understanding of social norms to streamline and optimize user engagement sessions. For example, Digital Green pivoted their solution to operate through extension workers to overcome the literacy constraints among their targeted end-users.
- Identify the relevant inclusive design skill sets you will need in your team in the proposal and planning phases, where possible, so that you can hit the ground running and do not need to build your own knowledge of how to deploy inclusive design processes.
- Resist the temptation to rapidly replicate a solution that has worked in one context into another without doing any local user research and testing.

Funding constraints

Undertaking a full suite of user research and co-design processes can appear to be an expensive process, particularly when developing a solution in a new market where there is insufficient data available on the target users. This is particularly true for hard-to-reach population groups where digital data collection tools are not an option due to internet connectivity and mobile phone access. However, not investing in these costs can often lead to wasted or duplicative spending later in the program. As an example, the MicroMentor case study in Module 2 showed how duplicating the design of a solution in one context into another without tailoring it to the requirements of local users was ineffective and involved wasted spending on advertising costs.

Funding can also come with its own constraints in terms of reporting requirements and incentives. Programs that are funded with the intention of reaching female farmers, for example, may not provide an adequate reporting and impact incentive to deeply understand the intersectional identities of female farmers and their unique user readiness requirements. As an example, Alliance-Bioversity's funding has limitations on being used for understanding the gender dynamics of farming households and including a variety of different users in testing workshops. Lastly, donor-funded programs often struggle with sustainability concerns towards the end of a program, and this is not sufficiently considered at the program and activity design phase.

Recommendations to mitigate some of these funding constraints are:

- When developing program proposals and funding requests, ensure there is an adequate provision for user research and participatory design at the outset. If funders do not see the value in this approach, there is a strong argument to make that this up-front investment prevents wasted expenditure further on in a program as feedback on a poorly designed solution is only received once it is being implemented.
- If you have a limited budget available for the understand - explore - define phases of design, make use of low-cost design methodologies that can deliver powerful design insights with limited spending required. Table 2.2 in Module 2 provides a comprehensive list of design methodologies - some of the lower-cost tools include persona analysis, a 'day in the life of…' assessments and using participatory storyboarding before a prototype is developed.
- In addition to assisting with time constraints, working with local partners and existing data and research can also address funding constraints by rapidly developing design hypotheses without needing to conduct extensive primary research. Including local partners into the design process can also help to address the sustainability of funding issues early on by considering the needs and incentives of ecosystem players from the outset.
- To address the sustainability issue of donor-funded solutions, consider which private sector actors are already engaging with, or have the potential to engage with your target user group. Working with existing private providers of digital solutions, and other market-related stakeholders, and designing activities that unlock their commercial incentive to continue providing the services to the target user group, can help shift away from the traditional vendor-client relationship which often results in services being turned off when the donor funding ends. Another approach is to enhance the capacity of local groups, such as farmer associations or cooperatives, to operate the solution once the program has ended as part of the program's activities.

Information constraints

Building a comprehensive view of the diversity of users in a community often requires compiling and accessing detailed information at the individual level. This is often at odds with much of the information that is publicly available - reporting on aggregated statistics or, at best, sex-disaggregated data. Access to the raw data that provides a nuanced view of an individual and their unique constraints is often limited.

On the other hand, where this data is available and where detailed user research activities can be conducted, the data can reveal large amounts of complexity! For example, Digital Green's chatbot aims to address the language diversity of the users where it operates. But in each of the three countries, there is a large amount of language diversity. There are over 100 languages in India, over 40 in Ethiopia and over 60 languages spoken in Kenya. It can be challenging to consider how a digital solution can meet the unique needs of all the potential users, or where to start.

Recommendations to mitigate some of these information constraints are:

- Make use of a persona approach to cut through individual complexity and group similar individual characteristics into user archetypes. The TechnoServe case study provides an example of this persona approach in action. However, the case study also identifies the risk of selecting one persona and assuming that most users fit into this archetype. Designing with multiple personas, and intersectional users, in mind is the most pragmatic way to cut through complexity but recognize the unique characteristics of users.
- If the identified user groups represent large diversity and different sets of requirements, beginning the pilot activities with the groups where you believe there will be the most momentum and results is a pragmatic starting point. Feedback from the pilot can be used to iterate and consider how the requirements of the next set of groups can be accommodated. For example, Digital Green's chatbot pilot is focused on farmers in cash crop value chains because their information bank was sufficiently robust for these crops. By receiving feedback from farmers on non-cash crops that they are also growing, Digital Green is preparing for the next iteration of the solution which will include non-cash crop farmers.

Activity 4.1

Assessing your implementation constraints

Having considered the range of constraints experienced by implementers of an inclusive design process, it is time to assess your own implementation constraints. Use the guiding questions below to identify which constraints are most relevant in your work.

1. How much capacity do the end users in your program have to participate in co-design activities? What are their unique time constraints that you would have to work around?

2. Which local partners can you collaborate with to better understand the requirements and capabilities of your end users, and assist with streamlining the co-design process?

3. Does your program team have experience with inclusive design processes? Where could you co-opt these skill sets from within your organization or implementing partners you work with?

4. Does your funding have specific line-items for co-design activities? How receptive would your funder be to approving expenses related to understanding users?

5. What has been your experience using data to understand your users better? Where are the sources of information that you could leverage or rapidly collect to assist with this?

TechnoServe's approach to user persona analysis for digital design

Overview

TechnoServe is a 50-year-old non-profit organization that focuses on fighting poverty by empowering producers and small business owners through scalable solutions. TechnoServe's experience has generated many references of

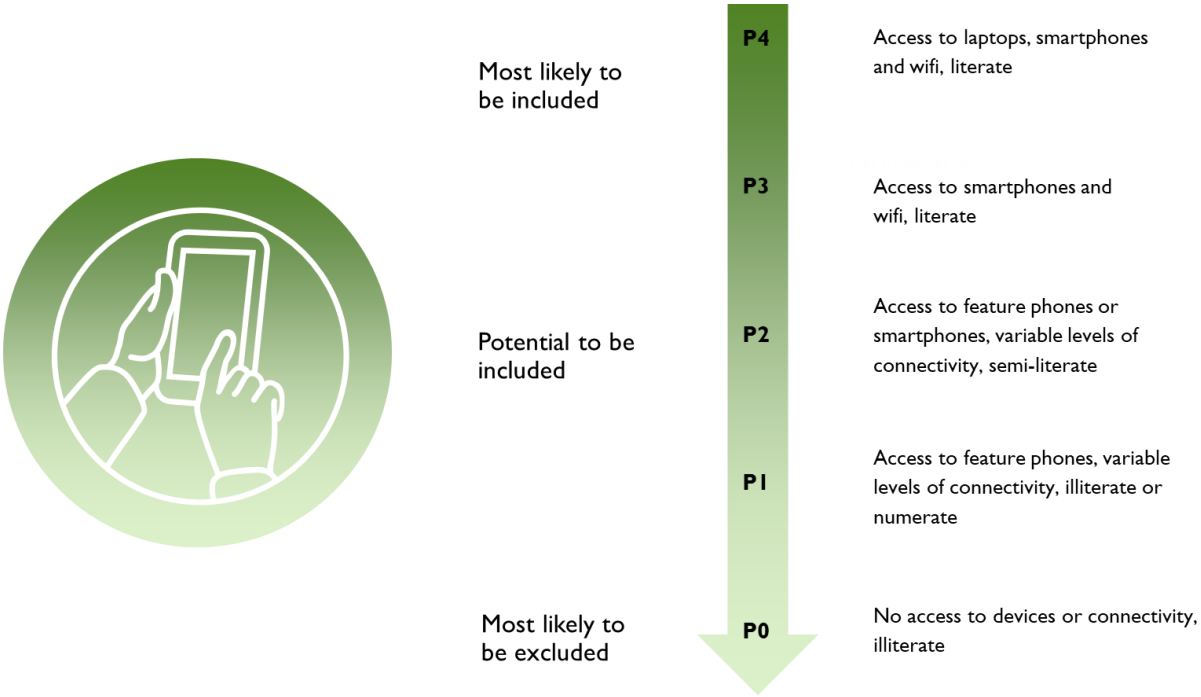
successful digital interventions. However, applying a 'cut and paste' approach to a digital solution design is often not successful if the underlying local circumstances and social dynamics of end users differ across regions.

As module 2 outlines, solutions are particularly prone to failure when they are replicated from one context into another, without considering the capacity of communities to engage with and derive meaningful benefits from the digital solution. To help identify ways to scale TechnoServe's impact, with the added benefit of developing more inclusive approaches to how TechnoServe implements digital solutions, the TechnoServe Labs were implemented. Labs are cross functional groups within the organization with the mission to identify, test and implement digital tools that can scale impact.

Understanding the user – the person who will ultimately be adopting the technology – are the Lab's starting point for building an effective digital intervention. In developing new technologies, TechnoServe Labs follows guidelines for developing new solutions that are digital provided by the Principles for Digital Development. These Principles cater specifically to the digital design considerations that need to be made by NGOs or non-profit organizations. If a digital solution is advisable, Labs then advises on what type of digital solution is most appropriate to solve for the identified problem. To achieve this, the TechnoServe Labs developed a user assessment tool that comprises five core user personas to help empathize with the underlying circumstances of participants. These personas are based on four criteria: 1) literacy; 2) access to technology; 3) accessibility; and 4) affordability of internet access. Using this framework, Labs can help staff and implementing partners to identify what kind of technology (if any) would be most appropriate for the local context. For example, in areas with limited internet access or low literacy, it might make more sense to share information via radio rather than online.

The below figure demonstrates these different user profiles and how they map to the Intersectional Digital Inclusion Framework. Whilst individuals who are illiterate and have no access to devices or connectivity are those most likely to be excluded from digital interventions; TechnoServe's approach is use the user persona template to understand upfront what type of solution is most applicable to each user profile, and then design appropriate interventions so as not to exclude any one group of participants.

Figure 4.1: Technoserve's User Profiles Mapped to the Digital Inclusion Framework



The people who fit these categories include the following kinds of end users across TechnoServe's programs:

User Profile 4: Most of the entrepreneurs that TechnoServe works with in larger cities in Latin America have access to a computer and a reliable internet connection.

User Profile 3: In East Africa, TechnoServe works with micro-retailers who primarily rely on smartphones and who have access to mobile data and/or Wi-Fi.

User Profile 2: Clients of TechnoServe's Business Women Connect program in Mozambique are an example of this category, primarily because they do not have regular access to reliable internet or mobile data services.

User Profiles 1 or 0: Many of the smallholder farmers TechnoServe works with around the world fall into these profiles because they do not have mobile devices or internet access, or they have literacy challenges.

Identifying the appropriate user persona is the first step in TechnoServe's five step Human-Centered Design (HCD) approach, where the first step is to understand the mind of the end user by empathizing with them. Once the user persona is identified, the challenge facing these users can be identified, and thereafter an appropriate solution can be designed through an iterative phase involving ideation, developing prototypes, and testing these prototypes.

Box 4.1: Where a user persona approach can fall short

TechnoServe has made an important step towards inclusive digital design by incorporating the user persona analysis framework in their digital design process. Assessing literacy (ability), access to technology, accessibility, and affordability are all important dimensions to assess in a user persona approach. However, there are other elements of the '6 As' framework outlined in Module 1 and Module 2 that are missing from this framework. Awareness - does the user see value in the solution and are they aware of the channels that will be used; and Agency - does the user have the self-efficacy to use the solution, and how to consider providing them with a stake in the solution's development - are equally important considerations.

This user persona framework also carries the risk of using aggregated data to try and fit all of the potential users of a solution into a single persona, and design with that one persona in mind. This can result in the user persona approach being overly reductionist. While TechnoServe's user persona approach has the benefit of simplicity and may be applicable to most of the users of a solution, it misses the opportunity of identifying the variable personas that exist within a community, and keeping their diverse requirements in mind as part of the design process. Another way to use a persona framework is to acknowledge the multiple personas that represent the complexity of a targeted community and consider all their requirements in a solution design. For pragmatic reasons, focusing on the requirements of 2-3 priority personas first in the initial design, and then catering to the requirements of other persons in later iterations, is a valid strategy.

Applying the user persona toolkit to achieve impact: Connecting cashew farmer trainers in Benin
TechnoServe partnered with BeninCajù to implement remote training by leveraging a cadre of extension agents using a training-the-trainer model. The challenge TechnoServe was aiming to address in this instance pertained to an updated version of the Benin field training manual for cashew farming and nursery management practices being introduced in 2020. These guidelines were lengthy and difficult to digest. Smallholder farmers lacked the necessary literacy (and time) to digest these new training guidelines - Women's literacy rates remain low, at 31%, compared to 54% of men, and women's empowerment is further complicated by early marriage, pregnancy, and school dropout.[68] This places smallholder cashew nut farmers at risk of perpetual lock out from up-to-date farming practices.

Over 53% of the Beninese population resides in rural areas and engages in subsistence farming.[69] Of these subsistence farmers, more than 200,000 families are involved in cashew farming on farms with an average size of one hectare.[70] However, 90% of cashew farmers lack access to mobile internet, severely limiting the opportunity to use remote training directly with the cashew growers.[71] In this scenario, the user profile for cashew nut farmers is likely to be User Persona 0, where farmers have low literacy rates, nascent device access, limited access to mobile internet and have low-income, particularly women cashew nut farmers. This profile assessment is informed by a combination of desktop research and local partnerships with extension agent networks who facilitate discussions with intended users in local language for TechnoServe to better understand the constraints facing these farmers.

Given the underlying constraints in terms of literacy and device access facing smallholder farmers, compared to less onerous constraints facing extension workers, TechnoServe and CajùLabs elected to develop a smartphone-based learning management platform that adapted materials from the lengthy formal training documentation into a digestible course accessible via the platform by extension workers. Extension workers are then able to verbally communicate these new guidelines to farmers to enhance their productivity. This solution leverages enhanced device accessibility and literacy of extension agents to indirectly enhance the learning of farmers.

Box 4.2: Leveraging intermediary parties that are trusted by participants can still perpetuate access issues

BeninCajù and TechnoServe strategically leveraged extension agents to disseminate training to farmers, relying on their characteristics of being more literate and having greater digital device access compared to smallholder cashew nut farmers. In doing so, agents are continually updating their skills and knowledge, making the information provided to farmers more

[68] TechnoServe. 2021. *Planting Gender Equality in the Benin Cashew Value Chain.* Available online.
[69] Ibid.
[70] Ibid.
[71] TechnoServe. 2021. *Digitally Enabled Training for Unconnected Farmers.* Available online.

relevant and valuable. However, while continual learning is being adopted by extension workers, farmers remain unconnected digitally, and continue to be reliant on extension workers.

Although pragmatic in reaching cashew farmers, the design of this solution did not focus on digitally including farmers, and rather focused on leveraging intermediaries with existing access to devices and enhancing their capabilities to then distill to farmers. A potential next step for this pilot is to identify and partner with community networks, as a mechanism of expanding internet connectivity to rural areas. These networks are owned and operated by local communities and have proven to be successful in providing affordable and reliable internet access in remote and underserved areas. This would complement the Government of Benin's current focus of liberalizing the telecommunications sector and increasing the availability of affordable smartphones and other internet-enabled devices.

Applying the user persona toolkit to achieve impact: Using video to enhance training for women farmers in Nigeria

TechnoServe partnered with ExxonMobil and Business Women Connect to augment in-person training with supplementary video and audio materials to make the training more convenient and effective for the women enrolled in the pilot. The Business Women Connect program, financed by ExxonMobil Foundation, had been providing in person training to 1,000 women farmers in Northern Nigeria related to financial literacy, agri-business and decision-making. The main motivation for the training being in person was that women farmers have limited access to mobile mobiles, particularly smartphones, limited online learning modules from being implemented. However, this in-person training had low levels of attendance because the times that they were taking place were when women were engaged in domestic or child rearing commitments.

In Nigeria, women constitute a substantial proportion of the country's farming population and provide about 60–80% of the rural labor input, performing multiple roles for the survival of their families.[72] However, patriarchal structures in rural areas in Nigeria are such that women are treated as minors under the authority of men (head of household) denying them direct access to agriculturally productive resources.[73] This lack of access is further exacerbated by cultural and institutional factors which often limit women's access to land ownership, labor and capital.[74] The Business Women Connect program aimed to address some of these issues by providing in person training to women. However, when compiling the user persona of these women, it was not immediately obvious to TechnoServe how much domestic and child rearing responsibilities of women would impact their initial solution design.

TechnoServe realized that the training information needed to be imparted in a way that was remotely accessible at convenient times to women. However, women's access to mobile phones is limited and typically comprises online feature phones, which do not support access to online, on-demand training. To overcome these technology access constraints, TechnoServe pre-recorded training sessions, allowing women to watch the video training sessions at the community centers, where they had access to projectors and tablets, at a time that suited them.

Box 4.3: Factoring-in language and cultural nuances to achieve meaningful scale

For offline benefit to be derived by participants, it is critical that it is provided in local and relatable language. In Nigeria, the language used to communicate agricultural information communicated via radio and television is significantly influenced by cultural nuances. For the training videos recorded for the Business Women Connect pilot to be scalable beyond the 1,000 women they are currently engaging with, it will be important for multiple versions of these pre-recorded training sessions to be produced in a variety of language dialects that is aligned to the ethnically diverse communities that comprise Nigeria.

[72] Adebola Adewumi Ajadi, Oladimeji Idowu Oladele, Koichi Ikegami, and Tadasu Tsuruta. 2015. "Rural women's farmers access to productive resource: the moderating effect of culture among Nupe and Yoruba in Nigeria." *Agriculture & Food Security* 4:26. Available online.
[73] Ibid.
[74] Ibid.

However, there is likely additional funding that will be required to support the development of such content through the use of generative AI that makes use of local language, LLMs to communicate information at a lower cost. USAID, in collaboration with the Bill and Melinda Gates Foundation, have previously investigated the impact that AI can have on making agri-food systems more inclusive in the report *Inclusively Advancing Agri-Food Systems through AI and Automation.*[75]

Digital Green's approach to accounting for gender dynamics in digital design

The context:

Founded in 2008, Digital Green is a global development organization well-known for its work with smallholder farmers across Ethiopia, India and Kenya, in addition to other low- and middle-income countries. Central to Digital Green's work is a recognition of the power of technology for overcoming persistent challenges to lift smallholder farmers out of poverty. One of the biggest challenges among smallholder farmers in developing countries is a lack of access to timely, accurate and actionable agronomic information. This type of information includes weather forecasts; types of fertilizer and pesticides to use, and when; and planting and harvesting techniques that can allow farmers to enhance their productivity and become more resilient. Extension workers, who are tasked with bridging this information gap, are spread too thinly. In India, 2019 estimates suggest that extension workers serve on average 750 households each[76] - far exceeding the FAO benchmark of 1:400.[77] Similarly, in Kenya at a county level there is a ratio of 1:2,000.[78] This insufficient coverage means that some of the hardest to reach farmers are left behind, and where coverage exists, changing climate conditions and new pests means that traditional advisory information is not always relevant or actionable.

How gender dynamics factors into the challenge:

Intersectionalities including age, literacy, digital access, and gender among smallholder farmers serve to compound the challenge of access to locally relevant and actionable information. Women typically only make up 10% of extension workers in the communities where Digital Green operates despite the fact that the majority of rural women are engaged in agricultural activities. In particular, 85% of rural women in India are engaged in agricultural activities, yet only 13% own land. Further, the prevailing social norms in many rural areas in India do not support the interaction between women farmers and male extension personnel, added to biases among the male extension workers regarding the applicability of agricultural extension services for women farmers. In Kenya, women farmers typically feel uncomfortable seeking help or advice from other men, leading to an even bigger advisory gap. In Ethiopia, unequal access to land-use and ownership among women, limited decision-making capabilities at a household level, unpaid care and domestic work limit their ability to generate meaningful income from the activity. Furthermore, there is a tendency for men to support men and women to support women, which results in women farmers being underrepresented and support being skewed toward men. Considering these systemic gender inequalities and women's undisputed, but often under-recognized contribution in the agriculture sector, raising women farmers' productivity and incomes becomes critical to improving rural livelihoods and lifting entire communities out of poverty.

Designing a gender-sensitive chatbot:

Since 2008, Digital Green has tackled these challenges by increasing the effectiveness of extension workers with a core approach which leverages peer-to-peer, video based learning and existing social networks. To improve the productivity and climate resilience of smallholder farmers, including women, Digital Green developed a generative AI chatbot. The chatbot provides farmers with locally relevant, timely and accurate agronomic information. In

[75] Genesis Analytics. 2023. *Can AI inclusively advance agri-food systems?* Available online.

[76] Nandi, Ravi, and Swamikannu, Nedumaran. 2019. "Agriculture Extension System in India: A Meta-analysis." *Agricultural Science Research Journal* 10. 473-479. Available online.

[77] The African Seed Access Index. 2022. *Country Dashboard.* Available online.

[78] Kilimo News. 2019. *Where are the Extension Workers.* Available online.

designing the chatbot, Digital Green paid particular attention to existing gender dynamics between farmers and extension workers, and the reality that hard to reach populations are often those unreachable by extension workers. To ensure farmers are provided with up-to-date, locally relevant and verified information, Digital Green considered how to establish a content corpus that was unbiased and incorporated accurate information. Current public datasets and research often exhibit biases towards male-centric crops, tasks and practices. To address this, Digital Green trained the chatbot on a domain-specific body of knowledge, utilizing their expansive library of gender-inclusive videos and integrated trusted local scientific research and vetted farmer call center transcripts. Whilst the chatbot pilot is focused on a few cash crops, such as chili in India and coffee in Kenya, the chatbot is able to provide women farmers with information on more strategic components of the farming process, for example seed varieties and what fertilizer to use; empowering them to become more involved in these practices.

Digital Green originally considered designing the chatbot solution to interface directly with smallholder farmers. However, they recognized early on that this design of the solution would only be reachable by a minority of female farmers - those with access to mobile phones, the digital literacy to use a chatbot solution, and where information from a digitally delivered solution would be trusted. This early conception of the solution did not address the existing exclusion dynamics of literacy and access to mobile devices faced by most smallholder farmers. This was particularly true given the intended users of the solution and the fact that women often have a lower rate of access to devices - a recent Oxfam report identified a gender gap of 30% in mobile device ownership in India.[79] Digital Green came to understand this from their 15-year-long-experience working with over 5.2 million farmers, 70% of whom are women, together with an understanding of which solutions resonate with them.[80] To create guardrails that protect smallholder farmers against AI hallucinations or inaccurate or incomplete AI-generated information, Digital Green works through extension workers to ensure the information is validated. This is a critical design point in ensuring the information conveyed to smallholder farmers has been reviewed and interpreted by trained professionals. Applying the digital inclusion framework from Module 1, the early conception of the solution would only serve those most likely to be included.

Consequently, Digital Green pivoted to designing the chatbot for use by extension agents, who play an intermediary role to provide smallholder farmers with information, because they are provided with mobile devices by governments and are often trained in how to use these devices. This was a pragmatic decision to reach as many farmers as possible in the pilot, but the hope is that eventually farmers can start to use the chatbot directly when they have the access and capabilities to do so - particularly after witnessing the benefits of the chatbot being used by an extension worker that the farmer trusts and is accustomed to engaging with. When piloting the chatbot, Digital Green facilitated focus group discussions with extension workers, ensuring an overrepresentation of women extension workers in these workshops to understand how the chatbot was being received. A critical learning from these usability workshops was the difficulty some extension workers faced in typing out farmers' questions due to poor literacy skills. Building off best practices in conversation user interface, Digital Green pivoted the design of their chatbot to allow extension workers to ask questions and receive answers via voice note functionality in the chatbot.

Inherent cultural and government agent program guidelines have helped to inform more locally nuanced design features of the chatbot. In Ethiopia, government extension workers are required to report back on how many farmers they engaged with. To factor this into the chatbot, Digital Green incorporated prompting questions including "How many male farmers did you engage with today?" and "How many female farmers did you engage with today?" in an effort to prompt extension workers to be more cognizant of who they are reaching through

[79] Oxfam. 2022. *Digital Divide: India Inequality Report 2022.* Available online.

[80] Genesis Analytics. 2023. *Insights from stakeholder discussion with Digital Green representative.*

their work. These nudges served as conscious reminders, fostering a heightened awareness about and importance of balanced and inclusive engagements with farmers.

Box 4.4: Is raising awareness sufficient to break down entrenched gender norms?

Entrenched gender roles in the agricultural sector across developing countries can prevent women farmers from harnessing the same income earning opportunities as their male counterparts. For example, in certain developing countries, women are prevented from bringing their crops to market or even leaving their villages without their husband's permission. Further obstacles such as access to and ownership of land, and access to credit for agricultural inputs widens the agriculture gap between men and women.

The prompting questions built into the Digital Green chatbot represent an important first step towards addressing these barriers. However, they are ultimately insufficient to address entrenched social norms and need to be accentuated with additional design features *and* program activities to adequately account for and address these norms. For example, once an extension worker has responded to how many women versus men they have responded to, the chatbot could respond with behavioral nudges such as target ratios, comparisons with the performance of other agents and explanations to the agent about why it is important to support more women farmers. Additional prompts that guide the extension worker on advice and support to provide to women farmers, including connecting them to MFIs, how to access markets etc. can empower women further. Ultimately, these design features need to be combined with program activities that can help women overcome these interconnected barriers.

To address this, Digital Green is working to integrate a service provider layer to allow market actors such as input sellers, content providers, cooperatives, and agri researchers to plug into the AI chatbot. This will increase women's access to these services and generate useful data that can allow these service providers to customize offerings based on farmer demand.

By incorporating a two-way feedback system into the chatbot, Digital Green allows extension workers to provide real-time responses, ensuring the dataset supporting the chatbot is continually refined. Extension workers and farmers can instantly validate or critique the information provided by the chatbot, by rating it with a thumbs up or a thumbs down. They can also provide detailed insights, like challenges with specific advice in a particular locale. This feedback loop is not only valuable for continued refinement of the chatbot, it also provides the users of the solution with an active voice in evaluating its impact and relevance to their situation (the offline benefit in the digital inclusion framework). In so doing, the solution provides users with a sense of agency and a stake in how the solution is developed going forward.

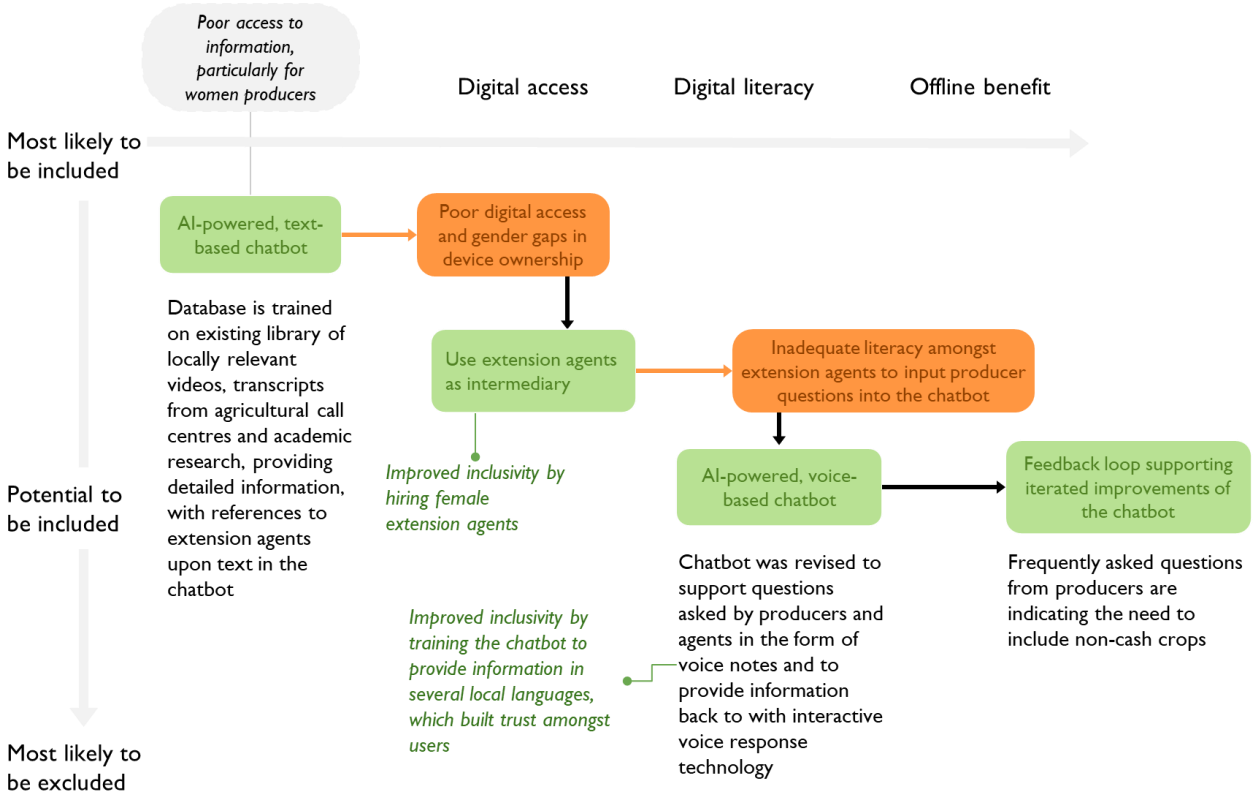
As an added benefit, the two-way feedback system records information asked by extension workers on different types of value chains, including less commercial crops. This information is reviewed by Digital Green and sent back to partner research institutions to motivate further research, and is how Digital Green plans to reach the last group of users - women involved in non-cash crop value chains, who are the most likely to be excluded. Cash crops generate more significant financial contributions to the economy and consequently are prioritized by research institutions and government-funded extension agent networks. Further, because of their economic contributions, male farmers tend to dominate cash crops, crowding out women from more strategic decision-making opportunities. As a result, women are typically more involved in non-cash crop/livestock farming, for example, dairy or fruit farming. However, there is less comprehensive research to inform these farming methods as academic funding typically prioritizes crops that contribute significantly to a country's GDP. This makes it difficult to compile a comprehensive database on certain farming practices and crops to inform a large language model (LLM) chatbot, and as a result, women remain excluded.

In summary, several inclusive design considerations were incorporated into this initiative, including:

- Sourcing and building more inclusive datasets (in this case specifically to train the chatbot);

- Conducting user research and usability testing with women while accounting for important intersectional identities;
- Hiring and training a more diverse product team, as Digital Green found it important in informing the empathy component of their design process;
- Building the product or interface, ensuring that the design itself is gender inclusive in terms of language capability and simplicity, color design, voice prompts and feedback loops; and
- Adapting training of extension agents and associated marketing of tools to be gender inclusive by training database of the LLM.

Figure 4.2: Simplified Overview of the Design Process



Early results from phase 1 of the pilot in India:
For the chatbot pilot in India, Digital Green trained 92 extension workers involved in the chili value chain across 3 states (Andhra Pradesh, Bihar, and Telangana). Of these extension workers, 47 were women.

Digital Green's internal analysis of the feedback collected from these three states indicate the women extension workers are more active users of the chatbot compared to their male counterparts, sending 2.5 times as many messages on average. This is indicative of the frequency of questions being asked by the women farmers they are engaging with, and how much and the type of information they are wanting access to via the extension agent.

The most frequently asked questions via the chatbot related to plant health and growth, followed by harvesting and processing, and subsequently planting and fieldwork. In addition, extension workers were asking several questions on how to respond to climate variability, demonstrating an awareness of climate change-related issues. This has

motivated Digital Green to enrich their knowledge corpus and dynamic content, including weather and financial data points, such that the chatbot's LLM can be connected to queryable data sources.

By designing gender sensitively, Digital Green aspires to be able to not only include women more meaningfully in the chili agricultural value chain but also in India's extension agent network. The higher frequency of engagement by extension workers on behalf of the women farmers they are engaging with demonstrates the usefulness of the chatbot.

Alliance-Bioversity & CIAT: participatory co-design of the Melisa Chatbot

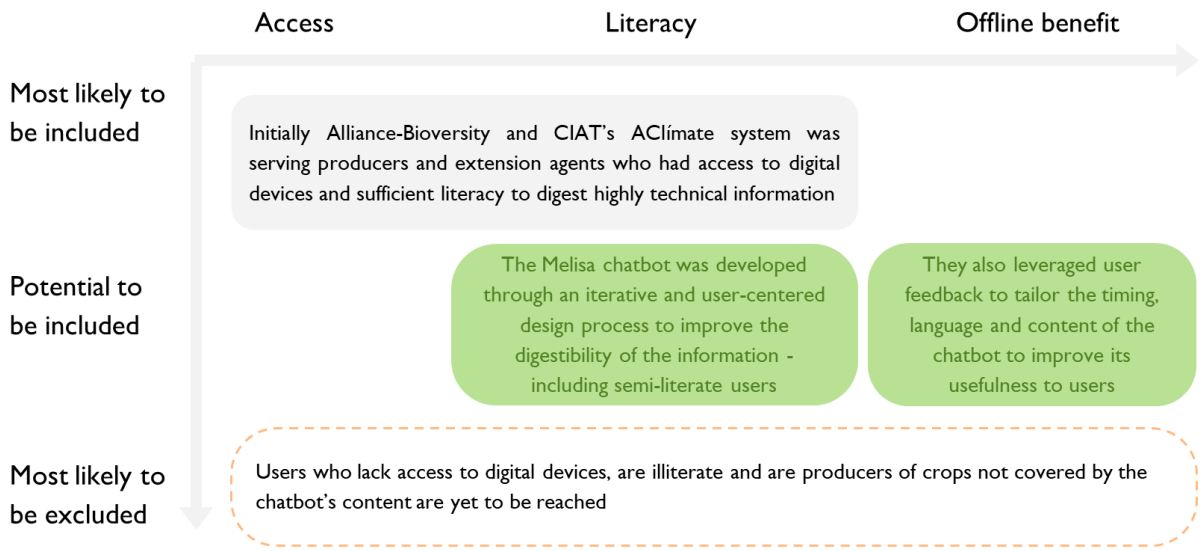
Overview

The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) are research for development institutes focused on building the climate resilience of smallholder farmers in Colombia and broader regions of South America. Colombia has been categorized as highly vulnerable to climate change due to its specific biophysical and socioeconomic characteristics. As an extremely heterogeneous country, climatic events vary significantly across the country, making a one-size-fits-all solution to strengthen climate resilience in the agricultural sector unrealistic. Rice and maize, amongst other crops, contribute significantly to smallholder farmers' livelihood and more broadly to the country's economic development and food security.[81] Without access to adequate weather and climate information, rice and maize farmers in Colombia cannot adjust their sowing dates and other agricultural practices, making them more susceptible to the consequences of adverse climate shocks.

Whilst academic research institutes have produced rich volumes of research on the impact of climatic shocks to rice and maize production in Colombia, and data scientists have built models which can track and predict some of these climatic changes, there is a disconnect between transference of these findings to smallholder farmers in the field. This gap is partly due to the digital divide between academic institutions and rurally based smallholder farmers who have limited access to digital infrastructure and nascent digital literacy. It is also due to a limited understanding of how to communicate this research to farmers in a way that is understandable, meaningful, and actionable to them. Whilst Alliance-Bioversity and CIAT cannot directly solve for the digital divide facing farmers, they are focused on bridging the information divide between research institutions and smallholder farmers in Colombia through the development of their ecosystem of digital tools. These tools include platforms that develop location- and climate-specific advisory information, allow users to create scenarios and conduct modeling, create agroclimatic forecasts, and most recently, a chatbot called Melisa that draws on these resources to offer agroclimatic information to farmers and the organizations that work with them.

[81] Loboguerrero, Ana Maria., Boshell, Francisco., León, Gloria.,. *et al*. 2018. "Bridging the gap between climate science and farmers in Colombia." *Climate Risk Management.* Volume 22. Pages 67-81. ISSN 2212-0963. Available online.

Figure 4.3: Expanding the Inclusivity Of Their Digital Solutions:



Alliance-Biodiversity & CIAT's journey to design a more inclusive digital tool was informed by their earlier experiences with the AClímate system, which was launched in 2017. AClimate automates the generation and provision of weather forecasts and communicates these via its website. This information was communicated in targeted newsletters, or otherwise via context-specific information analysis tools, data-driven agriculture strategy reports and a searchable data portal accessible on the website. The accessibility of this information was such that only technical extension workers and trained staff from growers' associations were engaging with the tool to enrich their knowledge and subsequently disseminate the information to farmers. However, smallholder farmers themselves were not engaging with the platform, firstly because they did not all have access to digital devices that supported access to websites, and secondly because the information was being depicted in a highly technical nature, making it difficult for farmers with low levels of literacy to meaningfully engage with the information.

Participatory co-design process

Realizing that there was a much larger audience both unconnected to extension agents and the AClímate system, Alliance-Bioversity & CIAT set out to bridge this gap. As the initial digital tool that would solve for this gap was not immediately obvious to the team, Alliance-Bioversity & CIAT initially conducted a significant amount of research via surveys and consultations with technical extension workers. This research was to firstly understand how to translate technical information being portrayed in graphs and tables into simplified, digestible information that can support decision-making for farmers; and secondly, to understand what type of technology would be best suited to communicate this information directly to farmers.

For the surveys conducted, Alliance-Bioversity & CIAT partnered with extension agent networks across different regions in Colombia as these extension workers were directly interacting with smallholder rice and maize farmers on a daily basis. Before deploying the survey, Alliance-Bioversity & CIAT spent time with extension workers to develop a protocol for the survey to accommodate for the varying levels of literacy and technology access by farmers across the country. The protocol considered different levels of proficiency of farmers and how to respond to each:

- For farmers who were illiterate, extension workers verbally asked them the survey questions and captured their answers on their behalf;

- For literate farmers that were unfamiliar with completing surveys online and did not have access to a digital device, extension workers gave them a printed-out version of the survey for them to complete;
- For farmers who were literate and were familiar with using digital devices, the online link to the survey was sent to them by the extension worker for the farmer to complete.

Working with extension workers had the added benefit of helping Alliance-Bioversity & CIAT navigate language nuances. Extension workers supported the institute to tailor the survey and surrounding communication to the local dialect of Spanish spoken in that region.

The survey focused on understanding what type of climate information farmers need as well as how they would typically ask these questions, how frequently they require this information, at what point(s) in the agricultural season this information was most necessary; how could it be communicated to them; and how would they like to receive this information. Based on the results of the survey, Alliance-Bioversity & CIAT decided to build the Melisa chatbot using an LLM database to ensure the information provided to farmers could be continuously updated with the most up-to-date and accurate research being undertaken by academic institutes.

Available on WhatsApp, Facebook and Telegram, the Melisa chatbot can be found and added as a friend on these social networks. Through the chat, users can ask her about what the weather will be like in the coming months, how much it will rain, and rice and corn crop yields – depending on the day the crop is sown and the variety of seed used. The design of the Melisa chatbot leverages existing technology platforms, including those developed by CIAT and those familiar to smallholder farmers (e.g., WhatsApp), as Colombia has high WhatsApp penetration.

Box 4.5: Recognizing the limitations of which constraints an initiative can solve

The Melisa chatbot is a novel digital solution that leverages existing social media and communication platforms already familiar to farmers to achieve scale. However, Alliance-Bioversity & CIAT noted that a difficult-to-solve constraint faced by the institute is the inherent digital divide faced by smallholder farmers who reside in rural areas with limited ICT infrastructure. A self-identified gap is the type of and number of farmers Alliance-Bioversity & CIAT can reach with the Melisa chatbot.

Currently, Alliance-Bioversity & CIAT is working with 500,000 farmers, although these farmers reside closer to urban areas such that they can go into a nearby town to access Wi-Fi, and the Institute identified that they are still far away from reaching very rural farmers. What is motivating to the Institute, however, is the general ICT infrastructure trend in Colombia. There is a push from the government to accelerate ICT infrastructure deployment and Alliance-Bioversity & CIAT are seeing a clear trend towards greater coverage, greater affordability of data packages, and more ownership of mobile devices. This incentivizes Alliance-Bioversity & CIAT to continue developing digital solutions for the agricultural sector in Colombia and more broadly across South America.

While the initiative recognized that it did not have the ability to solve the digital divide constraints, it employed other approaches to promote the inclusivity of its solution which it had more influence on. These included:

- Making the solution available through low-data communication channels that were already familiar to farmers with access to smartphones
- Working through extension agents to facilitate the transfer of knowledge to farmers that did not have access to smartphones
- Developing the advisory content to be specific to the needs of smallholder rice and maize farmers in Colombia through a participatory co-design process
- Training the chatbot to understand and communicate in different local dialects of Spanish

A critical challenge faced by Alliance-Bioversity & CIAT during the development of the chatbot was predicting and understanding what type of questions farmers were going to ask, and how they were going to ask it, particularly given the different dialects of Spanish spoken across Colombia. As such, the first version of the chatbot (which was not publicly released so as to avoid losing trust of farmers) worked well technically, but was not providing the most accurate answers to farmers' questions. What the first version did, however, was provide a valuable proof of concept to Alliance-Bioversity & CIAT's funders.

When designing the second version of the chatbot, Alliance-Bioversity & CIAT organized two types of additional user workshops. The first was only with extension workers with the purpose of orienting them to the Melisa chatbot and training them on how to use it, so that they could then go on to onboard farmers. Extension workers were also asked to provide feedback on the utility of the chatbot and if the information was being portrayed in a useful format and in the correct language. Partnerships with extension workers are highly effective, however, capacity strengthening is required to address any underlying biases. This is because most agronomic workers are men and they can have existing cultural and gender biases.

The second type of workshop was with extension workers and smallholder rice and maize farmers. Extension workers were asked to join this workshop to be able to communicate with farmers in their local dialect where necessary and to improve farmer attendance as farmers are more likely to attend workshops with recognized and trusted partners that they are familiar with. The purpose of these workshops was to better understand what type of questions farmers wanted to ask the chatbot, so that they could train the natural language process of the chatbot based on these questions. To ensure they were capturing the needs of different types of users, Alliance-Bioversity & CIAT worked with extension workers to understand how the cultural nuances and social norms of the targeted groups may impact their ability to contribute meaningfully. For example, to capture the opinions and needs of women farmers, separate workshops were held with them to ensure men farmers did not dominate the

conversation. A similar approach was taken to capture the needs of indigenous community members. Finally, the size of the workshops were altered based on the overall objective. For general reflection and learning, larger workshops were facilitated. For individual participation, smaller workshops with break outs for focused discussion were held.

A constraint faced by Alliance-Bioversity & CIAT when organizing the farmer-focused workshops was controlling for representation of several different characteristics of farmers because of time and capacity constraints. Time constraints specifically pertain to which stage of the agricultural season a workshop is being organized during. A critical learning from this project was that funders are not always cognizant of the seasonal nature of the agricultural sector and emphasized that farmers will not prioritize a workshop over their daily farming activities that are providing them with income.

Box 4.6: Capturing the needs of different intersectional identities

Leveraging in-person workshops with local partners that smallholder farmers trust was a critical design choice made by Alliance-Bioversity & CIAT to better inform the functionality and user-friendliness of their chatbot. However, a constraint faced by the institute was fully understanding and addressing how decision-making is made at a household level.

The objective of climate-related agricultural services is to influence decision making at the farm level. However, often decision-making on the farm level comes down to how household decisions are made and who makes them. This has the biggest impact on whether climate-related information is used effectively by farmers. It is not always the funders or the project's objective to understand inter-household decision-making dynamics. In Alliance-Bioversity & CIAT's experience, narrowly scoped projects that have an explicit focus on improved gender outcomes, but do not invest time in user-testing workshops and usability assessments, end up worsening the gaps between men and women because the decision-making at the household level still sits with the man as the head of the household.

As a next step, Alliance-Bioversity & CIAT are focused on modifying the Melisa chatbot to be a more farm-orientated system. For example, smallholder farmers typically farm more than one crop and make use of intercropping farming techniques. The intention is to develop the chatbot to provide advice to smallholder farmers as an integrated system, particularly as it relates to soil moisture and intercropping for jaggery sugar cane, plantains and coffee. Alliance-Bioversity & CIAT are now working with the Green Climate Fund and the Government of Colombia to move into these crops.

Activity 4.2

Putting it all together–Exploring digital inclusion in practice

Ready for more? In this final activity, you can link the toolkit concepts, processes, and practices to activities that you are envisioning or involved in. By applying the concepts from all the Modules to your work, we hope that you'll come to understand the very real challenges of digital inclusion. At the same time, we anticipate that you can now create actionable plans for digital inclusion, driving big benefits in agriculture, resilience, resource management, nutrition, and environment programming for FTF participants!

Use the following sets of questions to think more critically and comprehensively about digital inclusion in practice.

Module 1:

1. Which of the 6 As are the focus of your activity?

Putting it all together–Exploring digital inclusion in practice

    a. How successful has the IP been in proactively envisioning and addressing challenges regarding each A?
2. Which of the 6 As were overlooked and why?
    a. What could be the implications/consequences of this?
3. Which intersectional dimension(s) appear to have the most impact on people's journey to overcoming digital divides?

Module 2:

1. Based on your understanding of the participants in the ZOI, which user groups are…
    a. Likely included? How does this relate to this intersectional identity?
    b. Potentially included? How does this relate to this intersectional identity?
    c. Likely excluded? How does this relate to this intersectional identity?
2. What were the methods and processes that the activity staff could use/used to empathize with potential users?
3. What solution design decisions, modifications, or course corrections could be taken/were taken to address the needs of potential users?
    a. How might/how did these increase digital inclusion?

Module 3:

1. What is/was the desired offline benefit?
    a. How might/was this achieved and with what user groups?
2. What challenges might arise/arose during implementation and how could/were they addressed in
    a. programming and/or
    b. in the solution design?

Does your organization's approach to digital inclusion appear to be unintentional, considerate, or transformative?

Annex 1: Glossary

Caste: A form of social stratification characterized by a hereditary transmission of a lifestyle, which often includes an occupation, status in a hierarchy, customary social interaction, and exclusion. A caste system is a fixed ranking of a presumed supremacy of one group against the presumed inferiority of other groups on the basis of ancestry and other immutable traits. The most well-known caste system, in South Asia, excludes the Dalits from the recognized castes, traditionally relegating them to the stigmatized status of "untouchability."[82]

Digital intervention: Feed the Future (FTF) activities contribute to stronger food systems, better nutrition, and greater resilience to shocks and may, or may not, engage a digital intervention to help achieve these goals. For the activities that chose to engage digital tools to enable development outcomes, the portion of the activity which does so is the digital intervention.

Ethnic group: A group of people who identify with each other on the basis of common ancestry, language, culture, traditions, and/or customs. A non-comprehensive list of demonstrative examples of different ethnicities or ethnic groups include: Cape Verdean, Haitian, African American (Black), Han, Korean, Vietnamese, Cherokee, Mohawk, Navaho, Ojibwe, Cuban, Mexican, Puerto Rican, Polish, Irish, and Swedish.[83]

Gender: A socially constructed set of rules, responsibilities, entitlements, and behaviors associated with being a man, a woman, or a gender-diverse individual, and the relationships between and among people according to these constructs. These social definitions and their consequences differ among and within cultures, change over time, and intersect with other factors (e.g., age, class, disability, ethnicity, race, religion, citizenship, and sexual orientation). Though these concepts are linked, the term gender is not interchangeable with the terms women, sex, gender identity, or gender expression.[84]

Inclusive Development: The concept that every person, regardless of identity, is instrumental in the transformation of their own societies and their inclusion throughout the development process leads to better outcomes. USAID promotes a nondiscriminatory, inclusive, and integrated development approach that ensures that all people, including those who face discrimination and thus may have limited access to a country's benefits, legal protections, or social participation, are fully included and can actively participate in and benefit from development processes and activities.[85]

Indigenous Peoples: Indigenous peoples are known by different names in different places. The terms "hill people," "aboriginal," "first nations," "scheduled tribes," "pastoralists," are all terms for indigenous peoples. USAID follows the UN approach and does not adopt an official definition of "indigenous peoples," but rather identifies indigenous communities based on the following set of considerations and factors:

(a) self-identification as indigenous peoples, as well as recognition by other groups as being distinct;
(b) historical continuity with pre-colonial and/or pre-settler societies;
(c) strong links to territories and surrounding natural resources;
(d) distinct social, economic, or political systems;
(e) distinct languages, cultures, and beliefs;
(f) often form nondominant groups of society; and/or

[82] DDI/ID. Inclusive Development: Additional Help for ADS 201. (2023). See pages 17-25 for an extended glossary. Available online.
[83] Ibid.
[84] Ibid.
[85] Ibid.

(g) resolve to maintain and reproduce their ancestral environments and systems as distinctive peoples and communities. Not all indigenous peoples share all these characteristics.[86]

Intersectionality: The complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, classism, ableism, ageism, heterosexism, etc.) combine, overlap, or intersect, especially in the experiences of marginalized or underrepresented individuals or groups. An intersectional approach recognizes that many elements of a person's identity can impact how they experience the world. In combination with systems of inequality, these intersecting identities can lead to varying degrees of power and privilege that, in turn, create unique power dynamics, effects, and perspectives impacting individuals' place in society, experience of, and potentially access to development interventions. Further, an intersectional approach advances efforts to address the specific inequalities faced by women and girls, as they make up approximately half of the population in any given country.[87]

LGBTI: Lesbian, gay, bisexual, transgender, and intersex. This acronym is commonly used to refer to gender and sexual minorities. Variations exist that add, omit, or reorder letters (i.e., LGBT, LGB, GLBT, LGBTIQA – in which Q typically stands for "queer" or "questioning" and A typically stands for "ally" or "asexual"). Other related acronyms include MSM (men who have sex with men), and SOGIESC (sexual orientation, gender identity/expression, sex characteristics).

- Lesbian: A woman who is emotionally, romantically, and/or sexually attracted to other women.
- Gay: Emotional, romantic, and/or sexual attraction to the same gender. The term gay is used most often for homosexual men, though sometimes is used to refer to lesbians and bisexuals.
- Bisexual: Emotional, romantic, and/or sexual attraction to men and women.
- Transgender: An umbrella term that refers to an individual whose gender identity is different from their sex assigned at birth.
- Intersex: An umbrella term that refers to a variety of chromosomal, hormonal, and anatomical conditions in which a person does not seem to fit the typical definitions of female or male.[88]

Marginalized Groups: People who are typically denied full access to legal protection or social and economic participation and programs (such as police protection, political participation, access to healthcare, education, employment, etc.), whether in practice or in principle, for either historical, cultural, political, or other contextual reasons. Such groups may include but are not limited to: women and girls, persons with disabilities, LGBTI people, displaced persons, economic migrants, indigenous individuals and communities, youth and the elderly, religious minorities, ethnic minorities, people in lower castes, and people of diverse economic class and political opinions. These groups often suffer from discrimination in the application of laws and policy and/or access to resources, services, and social protection, and may be subject to persecution, harassment, and/or violence. They may also be described as "underrepresented," "at-risk," or "vulnerable."[89]

Non-dominant ethnic group: An ethnic group that is different from its country's or area's socially, economically, politically, and/or culturally dominant ethnicity. Non-dominant ethnic groups may be subject to stigmatization and discrimination, and experience other forms of unequal treatment. The term "ethnic minority" is often used, but in certain contexts a statistical ethnic minority can be a dominant ethnic group. Wherever possible, it is preferable to use the specific name of the ethnic group or groups you are referring to, instead of either of the general terms "minority" or "non-dominant group."[90]

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86 Ibid.
87 Ibid.
88 Ibid.
89 Ibid.
90 Ibid.

Non-dominant religious group: People who belong to or practice a religion held by a non-dominant portion of the population of a country, state, or region. Non-dominant religious groups may be subject to stigmatization, discrimination, and experience other forms of unequal treatment, especially when the religious differences correlate with ethnic differences. The term "religious minority" is often used, but in certain contexts a statistical religious minority can be a dominant group. Wherever possible, it is preferable to use the specific name of the religious group or groups you are referring to instead of either of the general terms "minority" or "non-dominant group."[91]

Oppression: The systematic subjugation of one social group to the benefit of a more powerful social group on social, economic, political, and cultural grounds.[92]

Participants: Activity participants in the Feed the Future context includes, but is not limited to, smallholder farmers, producer groups (crop and livestock cooperatives, outgrowers, etc.), micro, small, and medium enterprise owners (MSMEs) and employees, agro-dealers and input suppliers, and brokers and traders, among others. Digital interventions may be targeted toward any of these various participant types.

Persons with Disabilities: People who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others. Disability is caused by socially constructed barriers in the environment and not by a person's impairment or difference. Major Disability categories (with select examples) include:

1. Developmental - a diverse group of people with an impairment(s) in physical, learning, language, or behavior areas. Examples: cognitive disability, learning disability, autism
2. Sensory - a diverse group of people with an impairment(s) of the five senses - generally, this relates to hearing, vision or a combination of both. Examples: blind, low vision, deafblind, deaf
3. Physical - a diverse group of people with an impairment(s) of physical functioning, mobility, dexterity, or stamina. Examples: Cerebral palsy, wheelchair users, Limbic variants
4. Psychosocial - a diverse group of people with an impairment(s) with participation restrictions related to mental health conditions. Examples: bipolar, schizophrenia
5. Other - disabilities that do not fall under the above categories. Example: seizures.[93]

Privilege: Unearned social power accorded by the formal and informal institutions of society to all members of a dominant group (e.g., white privilege, male privilege, etc.). Unlike overt oppression or exclusion, it can be difficult to identify privilege because we are taught not to see it. Having privilege doesn't imply that a person's life is stress-free or easy; rather, it means that a person may face fewer obstacles in life than others. Society extends privilege, for example, to those with certain identity traits, those who live in certain geographical locations, or those with specific forms of employment.[94]

Religious Minorities: People who belong to or practice a religion held by a minority of the population of a country, state, or region. Religious minorities may be subject to stigma, discrimination, and prejudice, especially when the religious differences correlate with ethnic differences.[95]

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[91] Ibid.
[92] Ibid.
[93] Ibid.
[94] Ibid.
[95] Ibid.

Underrepresented groups: Groups that are disproportionately excluded from opportunities and systems (e.g., employment, political representation, services), often due to structural and societal obstacles and historical marginalization.[96]

Youth: USAID uses the terms youth and young people interchangeably. Youth is a life stage, one that is not finite or linear. USAID defines youth as individuals between the ages of 10 and 29; it also recognizes that those under age 18 are universally considered children and subject to numerous national and international norms and legal protections USAID seeks to reinforce. Based on international research on stages of youth development, USAID defines the different stages of youth as follows: early adolescence (10–14), adolescence (15–19), emerging adulthood (20–24), Transition to adulthood (25–29).[97]

[96] Ibid.
[97] Ibid.

Annex 2: Curated list of Resources

Useful resources related to Module 1: intersectionality, inclusion, and digital divides

Intersectionality

Inclusive Development: Additional Help for ADS 201. (2023). DDI/ID. USAID.

Guidance note on intersectionality, racial discrimination, and protection of minorities. (2022). United Nations Network on Racial Discrimination and Protection of Minorities.
Guidance document that grounds intersectionality in principles of equality, non-discrimination, and international human rights, including examples and recommendations for practitioners.

Inclusion

The Edison Alliance. (n.d.). The Edison Alliance.
Web-based platform launched by the World Economic Forum to accelerate collaboration within the digital sector and between other sectors to prioritize digital inclusion and foster achievement of Sustainable Development Goals.

Closing digital divides for specific participant groups

The Gender Digital Divide Primer. (2022). USAID, DAI Digital Frontiers.
A strong high-level overview of the core barriers to women's equal access to technology and potential opportunities to address it.

Ageing in a digital world: from vulnerable to valuable. (2021). International Telecommunication Union (ITU).
Report focusing specifically on how practitioners in the ICT sector can respond to the needs and requirements of ageing populations and use digital technologies to empower and socially include older persons.

Digital Inclusion of Youth. (n.d.). International Telecommunication Union (ITU).
Web-based collection of resources on the digital inclusion of youth, including resources focusing specifically on the use of ICT to foster youth education and employment.

Accessible and inclusive digital solutions for girls with disabilities. (2022). Unicef Gender and Technology.
Guidance brief on the development of digital platforms that are accessible for girls with disabilities. Document has broader relevance for inclusion of disabled people.

An inclusive digital economy for people with disabilities. (2021). Fundación ONCE & ILO Global Business and Disability Network.
Report outlining the implications of digitalization for people with disabilities and identifying required actions to design a digital economy that is more disability-inclusive. Focus on use of digital tools in a work and labor market context, but recommendations have broader applicability.

Engendering ICT Toolkit. (2018). The World Bank.
Comprehensive toolkit developed to support project implementers with designing and implementing digital development projects that promote women's inclusion.

Beyond the binary: A guidance for inclusion of LGBTI people in development activities. (2021). CanWaCH & GEWG.
Toolkit guiding practitioners on inclusion of LGBTIQ+ persons, examination of the impact of social and structural stigmas, and responding to specific needs of LGBTIQ+ persons.

Digital literacy

Digital Literacy Primer: How to Build Digital Literacy into USAID Programming. (2022). USAID, DAI Digital Frontiers.

This helpful primer first educates the reader on digital literacy and then applies this to the USAID program cycle and closes with an overview of digital literacy by sector and practice area.

Digital skills toolkit. (2018). International Communication Union (ITU).
Comprehensive guidance document on development of digital skills and capacity from basic to advanced digital literacy, with attention for multi-stakeholder interaction and inclusion of minority groups.

A global study on digital capabilities. (n.d.). The World Bank.
Report of a global study to the human capacity aspects of digital transformation which resulted in development of the digital capability framework that centers around leadership, skills, and culture.

Digital inclusion for low-skilled and low-literate people: A landscape review. (2018). UNESCO.
Guidance document with recommendations on designing digital solutions for and capacity building of people with low skills and literacy levels.

Useful resources related to Module 2: inclusive design, user-centered design, participatory methodologies

Design thinking and User centered design
Principles for Digital Development. (2016). DIAL.
Set of nine principles that have been developed to foster responsible and inclusive digital development which have been endorsed by many organizations who are active in the humanitarian and development sectors. The website provides various useful resources for each principle.

Design thinking v.s. UCD. (2019). Designers academy.
Article explaining the differences between design thinking and user centered design and describing the basics of the latter.

The co-create handbook. (2019). CO-CREATE consortium.
Guidebook informing future developers and implementers of participatory design processes about what, why, and how of designing together with users.

Inclusive design
The inclusive design guide. (n.d.). Inclusive design research center.
Web-based resource providing a collection of practices, tools, and activities to put inclusive design into action.

Designing inclusive digital solutions and developing digital skills: guidelines. (2018). UNESCO.
A toolkit that provides guidelines on the factors to consider, questions to ask, and process to follow when aiming for more inclusive digital solutions.

MEDICI transferability toolkit. (n.d.). MEDICI.
Handbook with guidelines, procedures, tools, and practical examples for inclusive digital design with a specific focus on vulnerable groups.

Gender inclusive design
Designing gender-inclusive digital solutions for agricultural development. (2022). CGIAR.
Comprehensive handbook on gender inclusive digital design with a specific focus on contexts relevant for FTF activities.

Practical methodological guides

The field guide to human centered design: A step-by step guide that will get you solving problems like a designer. (2015). IDEO.

Comprehensive toolkit providing a broad overview of the steps in a user centered design process with explanations for activities that can be used for each of the steps.

A collection of tools to bring human-centered design into your project. (n.d.). 18F Methods.
Web-based resource from the US government providing project implementers with a collection of tools that they can use in projects that adopt a user centered and participatory design approach

Monitoring and evaluation of designs or interventions

Digital-principles Focused Evaluation. (2016). DIAL.
Guidelines to evaluate a digital product or service according to the nine Principles for Digital Development.

Scaling of digital innovations
Scaling readiness. (n.d.). CGIAR.
A methodology to assess the readiness of a (digital) innovation for scaling, defining which other changes are required to foster successful scaling, and establishing strategies and collaborations to scale in practice.

GenderUP: A conversational method for responsible scaling. (n.d.). CGIAR.
This approach builds on scaling readiness but adds a gender and intersectionality lens and with a stronger focus on identifying and mitigating (potential) unintended, negative, consequences.

User centered data governance
Farmer-centric data governance: Towards a new paradigm. (2023). USAID, Bill and Melinda Gates Foundation.
Report helping practitioners to build capacity on the political economy of data, current and alternative data governance models in LMICs and their value, benefits, and limitations. It additionally provides hands-on principles and recommendations for user centered data governance.

Useful resources related to Module 3: incorporating digital into USAID programming and FTF activities

USAID program cycle and activity implementation
Managing Machine Learning Projects in International Development: A Practical Guide. (2022). USAID, DAI Digital Frontiers, Vital Wave.
This guide quickly reviews machine learning and then walks the reader through the project lifecycle and what to consider at each stage from feasibility to post implementation.

Digital Literacy Primer: How to Build Digital Literacy into USAID Programming. (2022). USAID, DAI Digital Frontiers.
This helpful primer first educates the reader on digital literacy and then applies this to the USAID program cycle and closes with an overview of digital literacy by sector and practice area.

2023 Gender Equality and Women's Empowerment Policy. (2023). USAID.
The recent GEWE Policy details the principles, objectives, and application of gender-related efforts to each sector, with a focus on social norms and an intersectional approach as foundational.

Integrating Inclusive Development Across the Program Cycle: USAID Toolkit. (2023). USAID.
The suggested approaches outline ways to apply ADS 201 to inclusive development efforts, taking inspiration from the ADS 205 gender domains and applying this more broadly, including disabilities and indigeneity.

Digital options and applications in FTF portfolio:
Digital Finance in USAID's Agriculture and Food Security Programming.(2023). USAID, DAI Digital Frontiers.

This report reviews various use cases of digital finance and outlines enabling factors for financial services. See page 11 for a resource list related to finances and FTF.

Digital for Resilience and Food Security Planning Tool. (2021). USAID.
This tool organizes additional resources by the potential and diverse needs of the reader.

Digital Tools in USAID Agriculture Programming Toolkit. (2018). USAID.
This report acts as a strong annotated bibliography to other resources, including examples and case studies, which can serve as a launching pad to learning more.

Building Resilient and Inclusive Digital Ecosystems: A Toolkit for Using Digital Payments in Development Programs. (2020). USAID, Nethope.
This in-depth toolkit covers ten steps to transition from cash to digital payments with specific instructions and activities for USAID and IP staff.