GSMA™

Mobile Technology for Participatory Forest Management

Co-designing and testing prototypes in Kenya

Summary Document

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Forests play a crucial role in stabilising our climate by regulating ecosystems, protecting biodiversity, absorbing carbon, and reducing soil erosion. However, forests and forest-related livelihoods remain under threat from deforestation and forest degradation. Consequently, halting forest loss and degradation, and promoting forest restoration, are central components of global climate mitigation and sustainable development strategies.
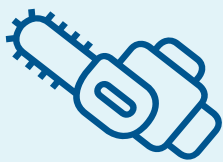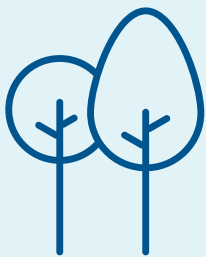
290mn hectares of forest were lost between **1990** and **2015.**
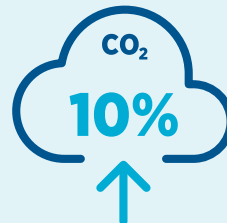
Every year forests absorb **a third** of the carbon emissions that humans release through the burning of fossil fuels.

Close to **1.6bn** people **rely on forests** for their livelihoods and subsistence.

CO_2 **10%** When forests are destroyed, much of the carbon they store is released into the atmosphere – tropical forest loss accounts for **nearly 10% of the world's annual carbon dioxide emissions.**
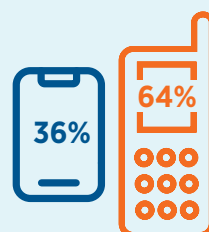
1.3bn 1.3 billion people are now trapped on degraded agricultural land.

53% Approximately **53%** of the Kenyan population subscribes to mobile services.

90% Almost **90%** of the Kenyan CFA members in our survey said that their livelihoods depend on forest resources in some way.

64% **36%** 36% Kenyan CFA members sampled, are smartphone users. **64%** are feature phone users.

↑**10%** Kenya's Constitution and the national development programme, Kenya Vision 2030, have set a target to increase the amount of land covered by forests to **10% by 2022**, up from an estimated 7.2% today.

Community Forest Associations in Kenya

Many low-and-middle income countries (LMICs) are focusing attention on community-led, or "participatory" approaches to forest management. These arrangements, through which local communities participate in **rule setting, monitoring, and restoring forests**, are expected to establish sustainable forest management practices and allow adjacent communities to reap sustainable economic and environmental benefits from the forest.

The ecological and technological context in Kenya, combined with a well-established participatory forest management (PFM) system, created an ideal context in which to investigate how digital technology could help make PFM approaches more effective.

PFM was formally embraced with the signing of the 2005 Forest Act, which established the process through which community members can form and register Community Forest Associations (CFAs) and assume responsibility for protecting, conserving and managing their local public forest in partnership with the Kenya Forest Service (KFS).

CFAs work with the KFS to establish a five-year Participatory Forest Management Plan (PFMP). External support from NGOs, private sector stakeholders, forest management consultants or lawyers is sometimes provided to CFAs to support the design and negotiation process of their PFMP. Beyond the committee, a CFA can be composed of hundreds, or even thousands, of general members who benefit from access to sustainable livelihood opportunities and are responsible for conducting a wide range of activities that help protect, manage and rehabilitate the forest.

Research driven by the voices of the local community

Our research sought to understand how MNO-delivered technologies can support PFM in Kenya.

Using a mixed methods approach we sought to gain a deeper understanding of incentives, benefits, and barriers in PFM, and explore and design for how digital technology can be leveraged.

Phase 1: Landscape framing

Desk research and stakeholder interviews were conducted to understand how PFM is currently working in Kenya, the partnerships and policies that have been created to support it, current and potential challenges that affect PFM implementation, and how previous or existing digital solutions are performing.

Phase 2: Qualitative interviews with CFAs

In-depth interviews and photo journals conducted with 21 CFA members allowed us to document their role in their CFA, their motivation for participating in PFM, how membership supports their livelihoods and/or affects how they access and use forests, barriers or risks they face to effective PFM, current use of technology in the CFA and their initial ideas on how digital solutions could benefit them.

Phase 3: Co-design workshop

A virtual design workshop was conducted with PFM stakeholders (the same as those in Phase 1) to develop three low-fidelity prototypes for digital technology solutions. The prototypes focused on solving specific problems a PFM faced, as identified by CFA members.

Phase 4: Prototype testing

The digital prototypes were tested remotely with 21 CFA members (the same as those in Phase 2) through phone interviews. As with the initial qualitative interviews, prototype testing explored the perspectives of CFA members on the value and usefulness of the digital tools and collected feedback on how they might need to function.

Phase 5: Quantitative validation

Finally, to help validate the qualitative findings and collect additional feedback on the digital prototypes, quantitative phone surveys were conducted with just over 400 individuals from 21 CFAs operating across the country. Thirty CFA members with smartphones also participated in an app-based survey.
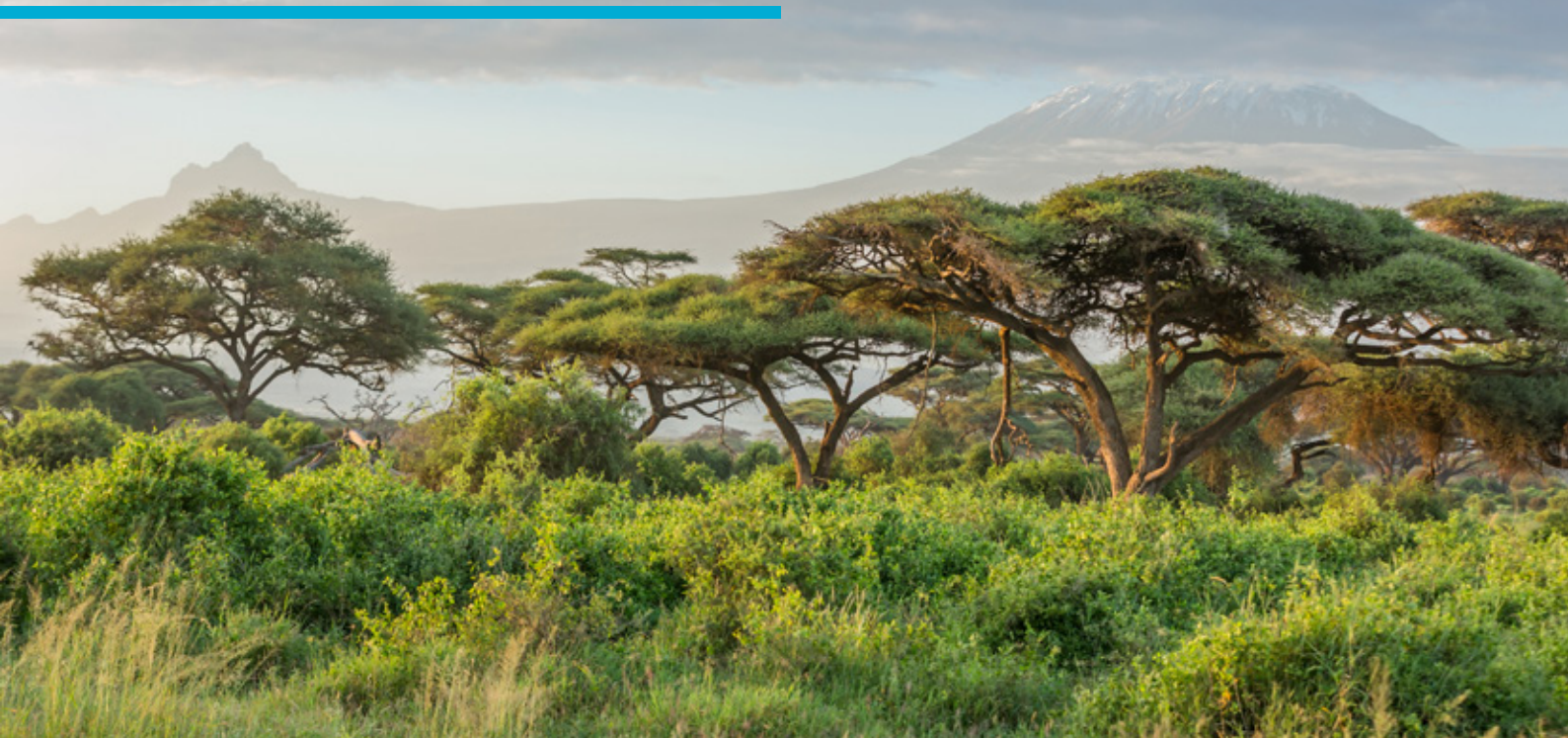
Key findings

Although Kenya presents its own highly contextualised challenges and opportunities, the research identified five cross-cutting findings that we believe are shaping the opportunity for digital innovation in PFM and may be applicable to PFM approaches in other contexts.

1. **CFA members are united by a passion for conservation and the need for sustainable income generation.** The members are likely to find immediate value in digital tools that support their conservation and regeneration efforts and builds their expertise.

2. **The use of digital technology is nascent, but growing.** The near-universal use of mobile services and growing access to smartphones indicates that most CFAs will possess the basic digital skills required to use mobile-enabled PFM tools effectively. However, solutions should be careful not to exacerbate the digital divide between smartphone and basic handset users.

3. **Current data collection activities are typically manual and slow, and provide little value to CFAs.** There is a clear need for digital tools that are simple to use and enable a wide range of relevant information to be collected and submitted in real time.

4. **Financial incentives could accelerate tree planting and other ecosystems services.** Financial incentives tied to tree planting could provide CFAs with the funding and motivation they need to accelerate tree planting and other PFM-related activities.

5. **Improved access to information could lead to better conservation and livelihood outcomes.** CFA members would benefit from platforms that offer site-specific, timely information; allow users to exchange insights within and outside their CFA; and provide access to the marketplaces and resources they need to be successful.

Three prototypes were co-design and tested

To explore how future digital solutions could address the challenges and opportunities we worked collaboratively with PFM stakeholders, to co-design three low-fidelity digital prototypes to test with CFA members.

Through in-depth interviews and digital survey tools, CFA members shared their perspectives on the value and usefulness of each mobile prototype, from the specific features or benefits that would promote adoption in their CFA, the potential risks or challenges users were likely to face and how each tool might need to function.
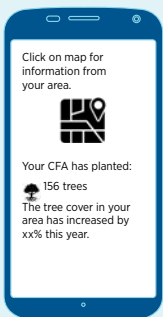
Prototype 1: Data collection

Enables CFA members to digitally collect and submit data from a wide range of conservation and regeneration activities. A critical and foundational tool providing real time reporting and practical insights. CFA members believed that mobile-enabled data collection tools offered a more efficient way to collect and share data compared to current manual processes.
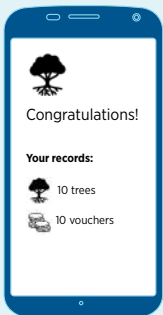
Prototype 2: Payment for ecosystem services

CFA members record the planting of new trees and receive a voucher to reward them for this activity. This platform helps fill the funding gap for tree planting activities and increases financial transparency. Viewed by CFA members as an opportunity to accelerate tree planting and attract new members.
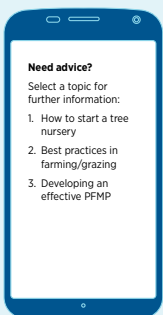
Prototype 3: Information sharing

CFA members gain access to information and advice from trusted researchers and other CFAs increasing the effectiveness of their work. There is strong interest in an information-sharing platform for CFA members to network and learn from each other, as well as connect with external stakeholders. This tool would require a strong user base and effective partnerships.

Designing and implementing new PFM tools will require a staged approach

Developing a minimum viable product

Step 1: Establishing digital data collection
Step 2a: Incorporating payments for ecosystem services
Step 2b: Incorporating information services

Partnering to drive uptake and use

Partnership requirement 1: Trusted organisations that can support capacity building
Partnership requirement 2: Local organisations with contextual insights
Partnership requirement 3: Mobile Network Operators (MNOs)

Moving to scale

Digital tools should be delivered with basic phone users in mind.
Plan for testing other business models that focus on private land.

Opportunities for MNOs

Close collaboration with MNOs is critical. These digital platforms are highly dependent on MNO assets and services, such as mobile internet access, smartphone penetration, digital payments and digital expertise. By collaborating closely with CFAs and other PFM stakeholders, MNOs can:

1. Build the business case for expanding network coverage into remote areas (in response to increased demand for connectivity);

2. Design tailored data packages and other solutions for rural consumers who are currently underserved;

3. Grow their customer base and build brand loyalty by helping to raise awareness of the benefits of PFM, and by increasing digital literacy and inclusion;

4. Leverage their assets and services to help digital platforms achieve scale and sustainability;

5. Expand and increase mobile money usage;

6. Bring like-minded organisations together to reduce fragmentation, share best practice and broker new partnerships.

Engaging in the design of PFM tools could help MNOs establish positive relationships with local government and development partners, help expand the country's mobile money ecosystem, create new revenue opportunities and support sustainability pledges or commitments.

As a next step, the GSMA ClimateTech programme aims to work with MNOs, PFM partners and other service providers to implement the actions and recommendations outlined in this report. We will seek to catalyse vital partnerships between the GSMA, the mobile industry, tech innovators, governments, and the development sector with the aim of reducing fragmentation, facilitating scale and promoting collective action.

← **Access the full report here**