Study on potentials of mobile phones in investment and development projects

FAO INVESTMENT CENTRE

BEST PRACTICES IN INVESTMENT DESIGN

FAO INVESTMENT CENTRE

Study on potentials of mobile phones in investment and development projects

Derek Poate
Director, ITAD

Edward Hedley
Consultant, ITAD

With Contributions by:

Takayuki Hagiwara
Natural Resources Management Officer, Investment Centre Division, FAO

Aidan Gulliver
Senior Economist, Investment Centre Division, FAO

BEST PRACTICES IN INVESTMENT DESIGN

Food and Agriculture Organization
of the United Nations

Director
Investment Centre Division
FAO
Viale delle Terme di Caracalla, 00153 Rome, Italy
or by e-mail to: Investment-Centre@fao.org

CONTENTS

ACRONYMS

AML	Anti-Money Laundering
BSP	Central Bank of the Philippines
CFT	Combating the Financing of Terrorism
CGAP	Consultative Group to Assist the Poor
FISD	Financial Institutions Supervision Department (Kenya)
FTC	Farmers' Text Center
GDP	Gross Domestic Product
GMC	Growth Monitoring Clinic
ICT	Information and Communication Technologies
INFSS	Integrated Nutritional and Food Security Surveillance
IT	Information Technology
KYC	Know Your Client
M&E	Monitoring and Evaluation
MFI	Micro Finance Institution
O&M	Operation and Maintenance
OFW	Overseas Filipino Workers
SIM	Security Identity Module
SMS	Short Message Service
UNICEF	United Nations Children's Fund
USD	United States Dollar

PREFACE

This study is one of the results of the "Sustainable Livelihood Development Project" being implemented in Kenya by the Kenya Forest Service (KFS) under FAO funding. The project has developed a mobile phone based monitoring system, which provides a number of key services, including real time reporting of the performance of the Livelihood Farmer Field Schools (LFFS) and LFFS facilitators. The system is designed in such a way that data is sent by mobile phone to a web-based database that automatically processes and aggregates the summary data for presentation through the project's web-site. The mobile phone system is also being used to issue rapid payments to field staff for travel expenses and by investment groups for repayment of loans received through the project.

In the past, Farmer Field School (FFS) projects typically tasked FFS facilitators to prepare monthly reports in a paper format. However, such a reporting method does not allow timely interventions to improve performance of LFFSs and facilitators. In addition, it is very difficult to monitor the performance of LFFSs, which often take place in remote areas which are sometime inaccessible to vehicles during the rainy season.

The project has provided one mobile phone to each LFFS group. The group leaders are required to monitor and report the performance of the LFFS and its facilitator. Information provided through mobile phones by group leaders includes such aspects as whether FFS participants are satisfied with their facilitators, whether the facilitators arrived at the meeting on time, and how many participants attended. With the mobile phone monitoring system, the project managers can see key figures and indicators through the internet and can take immediate action in real time if any signs of decline or wrongdoing of facilitators are detected. This system also gives the farmers more power to evaluate their facilitators and they can decide whether the project proceeds with the payments of facilitator allowances.

The mobile phones will also be used for withdrawals and repayments of revolving funds as well as facilitating individual saving through the mobile phone banking system of the project's private sector partner, Equity Bank. The system allows project beneficiaries to save the time and cost of travelling to Equity branches to make banking transactions.

Mobile phones are increasingly used in development projects and the technology is opening up new possibilities for the management of project field activities in general. The project's mobile phone-based LFFS monitoring system and the use of the Equity Bank's mobile phone banking system have proven the potential of mobile phones. In light of the success of the project, the Investment Centre, which is providing technical assistance to the KFS, has examined current knowledge on the use of such technology, as well as its future potentials, through a study of relevant experience concerning practical cases. The Investment Centre hopes that this study will be useful for future agriculture/rural development projects.

Garry Smith
Principal Adviser, FAO Investment Centre

EXECUTIVE SUMMARY

This report examines the potential for using mobile phone-based ICTs in development and commercial projects, considering issues such as the appropriateness and relevance of ICT systems in difference contexts, their replicability and scalability, and their sustainability. In the report, mobile phone-based ICT is defined broadly as systems of information and communication technology whose principal mechanism of facilitation is the mobile telephone.

Overview of the use of mobile phone-based ICT in development and commercial projects. The report offers a stock take of some of the principal applications for mobile phone-based ICTs in development and commercial projects and identifies some of the principal advantages attributed to their use. In doing so, it draws on a number of case study examples across a range of ICT applications, including:

- **PhilRice Farmers' Text Center** (agricultural extension)
- **The First Mile Project** (agricultural value chain information and access)
- **Texting with a purpose** (public health monitoring)
- **M-Pesa** (M-banking)
- **Child Nutrition Surveillance** (public health monitoring)
- **Jokko Initiative** (community development)
- **Text 2920/1178** (anti-corruption)

In reviewing these cases, the report identifies the innovation offered by the use of mobile phone-based ICTs in each context and the advantages attributed to their use. These advantages include improvements to the quality, efficiency and cost effectiveness of services, as well as opportunities to extend new services to poorer and geographically more remote people who have in the past been overlooked by the formal economy and traditional approaches to service provision.

Appropriateness and relevance of mobile phone-based ICTs in developing countries. A number of key 'enabling factors' are seen to enhance and support the successful introduction of mobile phone-based ICTs, including familiarity with the technology in the host country, technical support from donors, a conducive regulatory environment, previous experience in the use of mobile phone-based ICTs and, for commercial projects in particular, an effective business model.

The report draws on case study experience to examine the underlying factors which enhance or hinder the appropriateness and relevance of mobile phone-based ICTs in developing countries. These issues include any advantages which mobile phone-based ICTs are seen to offer over traditional systems, such as reduced cost of service or increased reach, timeliness and service quality, as well as their cost effectiveness and affordability vis-à-vis existing services. These issues also include technical factors and the costliness and complexity of ongoing operation and maintenance, as well as the reach and appeal of mobile phone-based ICTs to their intended end-users. This is further affected by the range of services offered and their functionality as

experience suggests that certain groups, such as lower income people, have different requirements with regard to such services from other members of society.

Replicability, scalability and sustainability. Alongside issues of appropriateness and relevance, further factors are seen to affect the ability for systems using mobile phone-based ICTs to be replicated, scaled-up and sustained. These are critical issues for both development and commercial organisations. Drawing again on case study evidence, the report examines some of the most important factors, including the degree of dependence on donor support, the appropriateness of the regulatory environment, the relevance of services to the needs of end-users, and technical considerations.

The report finds that while mobile phone-based ICTs are typically more affordable and cost-effective than traditional approaches to service delivery, and therefore better able to be scaled-up and sustained, this is not always the case, with some mobile phone-based ICTs requiring significant ongoing support from donors. The report also finds that the regulatory environment and the relevance of services to end-users are not fixed factors, but may evolve over time. Regulations may need to be revised, for instance, in response to demands for new or differentiated services which are not compatible with the present regulatory environment. The relevance of services to the needs of end-users is a key factor, and as a result the design and functionality of mobile phone-based ICTs may need to evolve over time to better meet these needs. Finally, technical considerations play an important role, with issues such as poor network coverage and an unpredictable electricity supply undermining the replicability and scalability of systems in more geographically remote locations.

1. Introduction

The report draws on the experiences of projects using mobile phone-based information and communication technologies (ICT) applications in a number of situations, including mobile monitoring and evaluation, m-banking, community development, literacy, anti-corruption, agricultural extension and agricultural value chain information and access. The projects considered are listed in Table 1.

The report begins with a general overview of the role that mobile phone-based ICT can play in development and commercial projects, focusing on the situations in which mobile phone-based applications are particularly appropriate, on the potential impacts that they can achieve and on their comparative advantages vis-à-vis other forms of mobile ICT.

The report then considers in more detail the experience of the projects in Table 1 in using mobile phone-based ICT, shedding light on such issues as the appropriateness and relevance of the systems used, their replicability and scalability and their sustainability.

Mobile phone-based ICT is defined broadly as systems of information and communication technology whose principal mechanism of facilitation is the mobile telephone. This definition does not exclude the use of other technologies to support the operation of such systems (such as computer servers and databases), but it refers to applications which are primarily built for, and around, the use of mobile phones.

Table 1

List of mobile phone projects

Project	Development Agency/ company	Country	ICT application
PhilRice Farmers' Text Center	PhilRice[1]	The Philippines	Agricultural extension
The First Mile Project	Government of Switzerland	Tanzania	Agricultural value chain information and access
Texting with a purpose	Catholic Relief Services	India	Public health monitoring
M-Pesa	Safaricom	Kenya	M-banking
Child Nutrition Surveillance	UNICEF	Malawi	Public health monitoring
Jokko Initiative	UNICEF	Senegal	Community development and literacy enhancement
Text 2920/117	Philippines National Police	The Philippines	Anti-corruption

[1] Philippine Rice Research Institute

2. Overview of the use of mobile phone-based ICT in development and commercial projects

Summary: the role of mobile phone-based ICT in development and commercial projects

- Interest in the use of mobile phone-based ICTs in development and commercial projects has grown rapidly. Many advantages are attributed to mobile phone-based ICTs, including:
  - Service quality improvements;
  - Efficiency and cost-effectiveness improvements; and
  - Extending the reach of services, including to poorer and geographically more remote people.
- A wide range of applications for mobile phone-based ICTs have been indentified, including:
  - Agricultural information services – to enhance the flow of information to farmers as part of extension services, as well as to enable farmers to access more accurate and timely information on market prices at different stages in the value chain;
  - Mobile monitoring and reporting – to enhance the speed, accuracy, efficiency and to reduce the cost of reporting;
  - Mobile banking (m-banking) – to offer easy access to cost-efficient (and therefore cheaper) banking services, services which will appeal especially to lower income clients;
  - Education and literacy – to enable people to communicate within groups and to practice and maintain literacy skills, as well as to deliver education and training; and
  - Anti-corruption – to give citizens the opportunity to report wrongdoing and to give feedback on the performance of public and private services.

This section draws attention to the types of opportunities and impacts offered by ICTs and the situations in which mobile phone-based ICTs are particularly appropriate. In doing so, it draws on the experiences of the case study projects.

Interest in the use of mobile phone-based ICTs in development and commercial projects has grown rapidly in recent years. Many advantages are attributed to mobile phone-based ICTs; among other benefits they are seen to offer opportunities to improve the quality, efficiency and cost effectiveness of services, as well as extending new services to poorer and geographically more remote people who have in the past been overlooked by the formal economy.

Mobile phone-based ICTs are thought to offer these advantages not only over traditional services, but over other forms of ICTs as well, as a result of their cost effectiveness and low barriers to entry for lower income, less literate and geographically more remote people.

In large part, the interest in mobile phone-based ICTs has piggybacked on the recent very rapid growth in the use of mobile phones in developing countries.

Some of the key applications for which mobile phone-based applications that have been used in recent years include information services; value chain information and access; mobile monitoring and evaluation; branchless banking; education and literacy; and anti corruption. This section will highlight the rationale for using mobile phone-based ICTs in these applications, the innovative approach used in deploying this technology and the outputs and impacts which have resulted.

2.1 Agricultural information services

One area which has received significant attention is in the provision of information services. In the field of agriculture and rural development, this interest has focused on the potential for mobile phone-based technologies to enhance the flow of information to farmers as part of extension services, as well as to enable farmers to access more accurate and timely information on market

prices at different stages in the value chain, and in doing so to enhance their market position and their profitability.

For example, the **PhilRice Farmers' Text Center (FTC)** in the Philippines aims to provide technical assistance to farmers, extension workers and other stakeholders through the dissemination of information on rice and rice-based technologies. The project has the specific aims of responding to individual questions by farmers and other clients, of communicating information on new farming technologies, and of linking farmers and other clients to markets. The technical platform selected to achieve these aims is a system based on short messaging service (SMS) on standard mobile phones.

Using SMS, FTC has established a nationwide system for disseminating technical advice to farmers and other stakeholders including extension workers and for receiving individual requests for information in return. Intermediary operators at the Center filter the queries sent by farmers, answering where possible, and sending the most technical questions to experts in the Philippine Rice Research Institute at the Department of Agriculture.

The model of using SMS in this way is innovative in that it offers a low cost, easily accessible, timely and mobile system to connect farmers and other stakeholders with expert sources of information, which is available nationwide, including in remote rural areas. These advantages are significant in that they have enabled the service to overcome many of the significant challenges to delivering extension services in the country. Inadequate access to new rice production technologies has long been recognised as a major constraint to increased rice productivity in the Philippines as a result of the fragmentation of agricultural extension services by regional administration, the relatively small number of professional extension workers and the difficulties associated with the archipelagic geography of the country which makes the coordinated delivery of such services difficult and costly.

The FTC service has witnessed very rapid growth in usage. In 2008, for example, a total of 24,727 messages were received, which alone represented an increase of 86.37 percent over the number received in 2007[2].

The **First Mile Project in Tanzania** uses SMS and voice calls from mobile phones to improve the availability, timeliness and quality of information on market prices and the activities of market actors among farmers and to improve communication between different market actors. This project relies more on user-generated information, however, and is an example of another application for mobile phone-based ICT which has received significant attention: to use mobile phones to improve farmers' market intelligence along the value chain, including knowledge of market prices and improved links to other market actors.

The First Mile Project aims to enable farmers, traders, processors and other people in poor rural areas to build profitable market linkages between producers and consumers and to build sustainable and reliable services along market chains, while tackling the challenges of access by rural people to relevant information and knowledge and to communication technologies.

With the support of the donor, the Government of Switzerland, mobile phones were provided to local producers and other actors, such as ***mkulima shu shu shu*** ("market spies"), who collect information such as when, where, and to whom farmers' products can be sold and in what quantities and at what price. The model is innovative in the way market spies have been trained in marketing and bargaining skills, so that they not only collect information but can negotiate deals with potential buyers, while staying in contact with farmers through their mobile phones. A further innovation is to integrate the mobile phone with other communications technologies, both old and new, including village notice boards and a website, to multiply its effectiveness.

2 Data from project documents: see references.

Use of mobile phones within this model has produced significant benefits for farmers. The mobile phone enables villagers to find out more about process in distant markets far beyond their traditional immediate trading partners, significantly increasing efficiency along the market chain. The mobile phones enable the market spies to be in close contact with their villages, improving the quantity and quality of market information in villages, reducing transaction costs (and the need for producers to travel to get price information) and increasing the speed with which producers can identify and act on new opportunities. This close contact also enables greater efficiencies in logistics, such as in the delivery of products.

The increased awareness of price and market intelligence information, and the greater communication between producers in the project, enhances their bargaining position vis-à-vis wholesalers and other middlemen and enables them to negotiate higher prices for their produce. The ultimate impact of using mobile phones is reflected in higher prices for producers. For example, in Uporoto in Mbeya district, the project claims that potato farmers increased their earnings by up to 150 percent simply by using their mobile phones to get up-to-date prices from Dar es Salaam[3].

2.2 Mobile monitoring and evaluation

Significant recent attention has also been focused on the potential for mobile phone-based ICTs to be used in mobile reporting, monitoring and evaluation. Mobile ICTs for mobile M&E are believed to offer advantages in terms of the speed, accuracy, efficiency and cost of reporting.

One example of mobile M&E is provided by **"Texting With A Purpose"**, a project of Catholic Relief Services in the Uttar Pradesh Region of India. The project aims to improve health reporting by training community health workers in the use of a mobile application which is installed on mobile phones. Information on observed live births and deaths is entered by the health workers into a closed-response form on their mobile phones when they are visiting community health stations and transmitted via SMS to a central database. The data is then available for close-to-real-time monitoring of maternal and neonatal health in the region.

The use of SMS to transmit data from standard mobile phones is innovative in that it provides a relatively low cost and flexible technical solution to improving health reporting in the field. The project reports that, as a result, the accuracy and speed of birth and death reporting rapidly improved in the region; reporting of births was raised to 100% and became almost instantaneous.

A similar and further example is provided by a project to use mobile phones to improve **child nutrition surveillance in Malawi** by UNICEF Malawi. The project aims to address weaknesses in the existing system of child nutrition monitoring by using an application powered by SMS. The model involves training health workers to enter data which are transmitted to a central server using the RapidSMS system.

The system is innovative in that it is capable of automatically aggregating data into a central database and of analysing the data for indictors of child malnutrition. The system is capable of providing instant feedback messages to health workers with instructions for further care. Reports of the automatically-generated data analysis are also posted on the project website.

The project has adopted a relatively low risk, low cost model of mobile data collection by using an open-source, tested software platform (RapidSMS) and driven by SMS sent from standard mobile phones. This use of a mobile phone-based application has greatly enhanced the speed of the reporting and monitoring process and enabled close-to-real-time feedback messages and instructions for further care to be delivered to health workers in the field.

2.3 Mobile banking (m-banking)

Of all the forms of mobile phone-based ICT to have emerged in recent years, m-banking, or branchless banking, has attracted some of the most significant attention. M-banking differs from

3 Data from project documents: see references.

the other examples of mobile phone-based ICTs reviewed in this report in that it has primarily been developed and exploited by commercial companies, typically by mobile phone service providers and by banks.

While private companies believe that m-banking services will appeal to large numbers of mass market clients, and therefore have the ability to be transformed into profitable and sustainable business models, there is a strong expectation that m-banking services will also produce developmental outcomes. This is based on the perceived potential for m-banking services to offer easy access to cost-efficient (and therefore cheaper) banking services, services which will appeal especially to lower income clients and in doing so will play a central role in extending formal banking services to the world's many poor and unbanked people.

One further particular area in which mobile banking is predicted to have a significant developmental impact is in the sending of domestic and international remittances. As a DFID study in 2009 illustrates, "mobile remittances offer the prospect of cutting the transaction cost to the customer by half – a saving that could go directly into the pockets of many of the poorest people in the World. Indeed, if all of global remittances were sent by mobile, it would save around $13 billion a year – more than the UK's annual aid budget (DFID, 2009).

In the Philippines, for example, the government has been interested both in the role m-banking can play in extending formal financial services to unbanked people and in offering more efficient transaction services to overseas Filipino workers (OFW), whose remittances in 2008 amounted to approximately USD 18 billion, approximately 11% of GDP. Given that many OFWs come from geographically-remote provinces where access to formal financial infrastructure is limited, these interests converge, multiplying the potential benefits offered by m-banking solutions.

A wide range of m-banking services have emerged in the last decade. While not among the first, the **M-Pesa service offered by Safaricom** (a subsidiary of Vodafone) in Kenya has attracted attention as one of the most successful. M-Pesa is an electronic money transfer and payment system based on mobile phones in which registered customers are assigned an individual electronic money account that is linked to their mobile phone number and is accessible through a SIM card-resident application on the mobile phone. Using the M-Pesa electronic money account customers can deposit and withdraw cash to/from their accounts by exchanging cash for electronic value at a network of retail stores.

M-Pesa has proven to be very popular with customers and has grown very rapidly since its introduction in 2007. By mid-2010 it was being used by more than 9 million customers in Kenya (approximately 40% of the adult population). This year Safaricom built on this success by launching M-Kesho, a development of the M-Pesa system which enables subscribers to access the financial products of Equity Bank (including savings and loans).

2.4 Education and literacy

Mobile phone-based ICT has also been used in projects to improve education and literacy. For example, the **Jokko Initiative from UNICEF** in Senegal aims to use a mobile phone-based SMS application to increase the use of text messaging in the community and, in doing so, literacy and numeracy skills. The project uses a RapidSMS-powered 'SMSForum' which has been designed to enable members of the community to establish their own SMS-based discussion forums to inform each other of community activities and to discuss topics of interest to the group.

The Jokko initiative makes it possible for individual members of community forums to communicate with a wider network of forum members by sending only one text message. This means, for example, that group members can practice newly-acquired literacy skills or that a literacy leader or a representative of a women's association etc. are able to communicate with community members about important activities in the village (for example, a vaccination campaign or a literacy group meeting).

Project documentation reports increased use of SMS and sustained and improved literacy as a result of the introduction of the SMSForum: the 15 villages which had literacy training and access to the SMSForum had higher literacy scores after six months than the 5 villages which underwent the same training but did not have access to the SMS Community Forum[4].

2.5 Anti-corruption

Mobile phone-based ICT has been used in various systems to give citizens the opportunity to report wrongdoing and to give feedback on the performance of public and private services. One early example of such a service is the **Text 2920/117 service in the Philippines** which allows citizens to seek emergency assistance, to report crime and, especially, to report wrongdoing by police officers.

The system can be used to report any type of wrongdoing and corruption by police officers: abuse of members of the public, ineffective policing, police officers demanding bribes in relation to real or bogus crimes, protection payments demanded from businesses, failure to arrest criminals, or even direct involvement in criminal activity.

Text 2920/117 is innovative as one of the first examples of a mobile phone-based system to enable citizens to anonymously report cases of wrongdoing by public officials. The system has achieved success because it uses a technological application (SMS) which is already very familiar and popular in the Philippines and which is widely accessible and affordable. As such, the system has significantly reduced the barriers to reporting complaints about police wrongdoing.

A Ghanaian start-up firm, **mPedigree**, has come up with a clever way to use mobile phones in the fight against counterfeit drugs. Participating drugs companies emboss a special code onto packages, which customers find by scratching off a coating. By sending a free text with that code, they can find out instantly if the package is genuine or a fake (The Economist, September 2nd, 2010, print edition).

4 Data from project documents: see references.

3. Appropriateness and relevance of mobile phone-based ICTs in developing countries

Summary: appropriateness and relevance of mobile phone-based ICTs

- The key 'enabling factors' behind the successful introduction of mobile phone-based ICTs in developing country contexts include:
  - Familiarity with the technology in the host country – mobile phone-based ICTs benefit from the recent rapid increase in use of mobile phones in developing countries which has fostered an overall familiarity with the technology;
  - Technical support from donors – despite the overall familiarity of mobile phones, donor support is often required, especially where a non-standard and/or more complex application or activity is being introduced;
  - Regulatory environment – pragmatic and flexible regulation plays a key role in supporting the introduction and continuing development of services, especially m-banking;
  - Business model – is an important factor in the early growth of commercial services such as m-banking, which further determines whether they reach a 'critical mass' of clients; and
  - Previous experience in mobile phone-based ICT systems – can be an important contributing factor to the successful introduction of mobile phone-based ICT.
- The appropriateness and relevance of mobile phone-based ICTs in specific situations is further determined by:
  - Advantages over existing systems – whether they contribute to reducing the cost and improving the reach, timeliness and quality of existing services, or if they offer innovative new services;
  - Cost effectiveness and affordability – whether they deliver on the potential for services to be redesigned in more cost-effective and affordable ways, which can make services more relevant to lower-income individuals;
  - Reach and appeal – whether they have wide-based appeal and are successful in achieving the potential of extending servicers to lower income people. The available evidence is mixed, but generally positive in this regard;
  - Range of services offered and functionality – whether they offer the type of services and functionalities that are valued by their intended users. Experience suggests that lower income people may have different requirements from other members of society; and
  - Technical factors and cost of operation and maintenance (O&M) – whether the technical demands and ongoing costs of O&M are appropriate to the situation in which the project operates. Such requirements can be larger than first anticipated.

This section of the report considers the appropriateness and relevance of using mobile phone-based ICTs in developing country contexts. Drawing again on case study experience, it highlights the principal 'enabling factors' behind the successful introduction of mobile phone ICTs. It also draws attention to the factors which enhance the appropriateness and relevance of such systems in developing country situations, as well as the factors which mitigate against these. In the case of m-banking, particular attention is focused on the role the regulatory environment plays in supporting (or otherwise) the introduction of such services.

3.1 Enabling factors

3.1.1 Familiarity with the technology in the host country

A key 'enabling factor' behind the successful introduction of mobile phone-based ICTs in developing countries is the degree of familiarity

with the technology. As noted above, a principal motivation behind the recent interest in the use of mobile phone ICTs for commercial and development applications is the rapid increase in the use of mobile phones in developing countries. Mobile phones are seen as a familiar, and therefore easy to use, platform on which to base mobile ICTs. These factors will, in theory, have the further advantage of reducing the requirement for infrastructure and training support.

Such enabling factors are strongly apparent in the Philippines, particularly for SMS-based applications, as the Philippines has a highly dynamic and competitive mobile phone sector and has experienced rapid growth in mobile phone use. In particular, sending SMS is a familiar and very popular form of communication in the Philippines, with 66 million Filipino mobile phone subscribers sending 2.37 billion text messages in 2008 alone.

The initial success of the PhilRice FTC and Text 2920/117 (and m-banking services in the Philippines which are discussed further below), drew heavily on these enabling factors. This served to reduce barriers to entry, encouraging rapid take-up of the new services.

The rapid growth in use of mobile phones in Kenya and Senegal were also key enabling factors in the success of M-Pesa and the Jokko Initiative respectively. In Senegal, as in the Philippines, it was the rapid growth in mobile phone use in rural areas, especially in the use of SMS (which is the cheapest form of communication over distance), which made the introduction of a mobile phone-based ICT feasible in a rural setting.

3.1.2 Technical support from donors

In spite of the familiarity and popularity of mobile phones in many developing countries, technical support from a donor is often a key enabling factor in the introduction of a mobile phone-based ICT. This is especially the case when a non-standard and/or more complex application or activity is being introduced, or where an ICT application is being utilised in a location which has lower levels of mobile phone use, literacy and information technology (IT) skills.

In the Texting With A Purpose project, the mobile phone-ICT application ran on standard mobile phones but was relatively complex to use, requiring health workers to enter pre-coded information into a closed-response form with a very high degree of accuracy. In locations with relatively low levels of literacy, and among health workers with limited IT skills, the introduction of the mobile phone ICT application required ongoing technical support from the donor.

In the First Mile project, donor support was also instrumental, not to support the introduction of a complex mobile phone-based ICT application (the project relied on SMS and voice calls only) but to support new activities in order to get the most value out of the use of mobile phones. As such, the donor provided training in both marketing and negotiation skills to 'market spies' so that they were able not only to report market information to farmers via mobile phones but also to negotiate prices with wholesalers and consumers.

3.1.3 Regulatory environment

The prevailing regulatory environment can play a critical role in either enabling or hindering the successful introduction of mobile phone-based ICTs. Given the focus of this paper, particular attention here is focused on the regulation of m-banking services, drawing on the experiences of Kenya and the Philippines.

The central challenge for regulators and policy makers with regard to m-banking is two-fold. First, they need to encourage banks and mobile operators to develop solutions that are not proprietary and are therefore interoperable between service providers, both domestically and across borders. Second, they need to allow access to the sector to potential new entrants who can compete with the lucrative business models of the existing banks and mobile operators to encourage the development of a dynamic and competitive sector. Regulators aim to achieve these two ends while at the same time ensuring high levels of security and trust

in m-banking systems, a demand which has a significant bearing on the regulation enacted to support new m-banking services.

The type of m-banking sector which this regulation is intended to underpin is one which provides adequate protection for consumers, ensures economic stability, provides interoperability of electronic systems and guarantees the security of transactions. While allowing for mobile payments and cash transfers, central banks are entrusted to ensure the stability of the banking and payment systems and also ensure that the issuance of e-money does not harm the national economy. In order to monitor the level of credit in the market, there should be an adequate level of transparency and the anti-money laundering and know-your-customer principles must also be applied to mobile payments. A 2006 report from DFID provides a list of key issues for financial regulators to consider when preparing proposals and regulations for new m-banking systems.

- Are consumers adequately protected? (from risks of fraud, loss of privacy and loss of service in order to establish trust among customers. These risks are higher when agents are involved in the business model and are highest in non-bank-led systems).
- How do m-payments affect the stability of the banking system and national payment system?
- Does the law distinguish adequately between payments and deposits?
- Does the law provide for e-money issuance? (a legal framework which gives authority to provide or accept payment in electronic form).
- Is there provision for agents to withdraw and deposit money?
- How do anti money laundering (AML)/ combating the financing of terrorism (CFT) regulations affect account opening and cash transactions?

Regulators in Kenya and the Philippines have been particularly successful in creating conducive enabling environments for the adoption of m-banking in their counties by addressing many of these issues. In any review of international experience in the sector, a consideration of the regulatory environment and decisions taken by regulators in these countries is instructive in order to draw out elements of good practice. Further details are provided in Annex I.

3.1.4 Business model

The business model adopted by commercial companies when introducing mobile phone-based ICTs can also be a significant enabling factor. For example, **M-Pesa** adopted a clever service design that facilitated rapid adoption which, when combined with an effective business execution strategy, enabled M-Pesa to reach a critical mass of customers quickly and to avoid two-sided market effects that can hamper new payment systems.

3.1.5 Previous experience in mobile phone-based ICT systems

Previous experience on the part of donors in using mobile phone-based ICTs can play a significant positive role in enabling the successful adoption of mobile ICTs in subsequent projects. For example, the **mobile surveillance system for child nutrition** developed by UNICEF Malawi benefited from UNICEF's previous experience in using RapidSMS in its supply chain monitoring of Plumpy'Nut, a ready-to-use therapeutic food, in Ethiopia.

3.2 Appropriateness and relevance

The enabling factors outlined above are in themselves important factors in rendering new mobile phone ICTs appropriate and relevant to their surroundings. There are other factors, however, which can either enhance or reduce mobile phone-based ICTs' appropriateness and relevance in specific situations. Such factors play a critical role in the relative success of mobile phone-based ICT applications and can be either endogenous or exogenous to the project in question.

3.2.1 Advantages over existing systems

A key factor in determining the appropriateness and relevance of mobile phone-based ICT

applications is the extent to which they offer three distinct advantages over existing systems:

- to lower the cost of existing services;
- to improve the reach, timeliness and quality of existing services; and
- to offer innovative new services.

For example, UNICEF Malawi successfully used a mobile phone-based ICT application based on RapidSMS to overcome some of the limitations of the existing system for child nutrition data collection. The **Integrated Nutritional and Food Security Surveillance (INFSS)** system uses a random sample of children visiting growth monitoring clinics (GMCs) to measure trends in child nutrition, but faces challenges including poor data quality, time delays between data collection and analysis, and high participant dropout. Since chronic child malnutrition remains a serious problem in the country, the limitations of the INFSS system are a serious threat to the country's ability to anticipate and plan for current and future nutrition and food security crises.

In comparison with the existing method of collecting data on child nutrition, the new mobile phone-based RapidSMS system has a number of advantages, including:

- A significant reduction in data transmission delay compared to Malawi's current paper-based system;
- An increase in data quality reported by health workers;
- Elimination of the need for time-consuming manual data entry;
- Increased two-way flow of information between stakeholders at the national government level and health workers in the field;
- Increased system and personnel monitoring capabilities; and
- Elimination of costs related to transporting paper forms and manually entering data.

The **PhilRice Farmers' Text Center** has also been successful because it offers clear advantages over the existing systems of agricultural extension. Inadequate access to new rice production technologies has long been recognised as a major constraint to increased rice productivity in the Philippines as a result of the fragmentation of agricultural extension services by regional administration, the relatively small number of professional extension workers and the difficulties associated with the archipelagic geography of the country which makes the coordinated delivery of such services difficult and costly.

By using a mobile phone-based ICT, PhilRice has managed to overcome many of these challenges and has designed a system which has national coverage, including in rural areas, uses a technology which is familiar to farmers, is low cost both for users and in terms of operation and maintenance and which is able to provide rapid and updated technical advice.

The use of mobile phone-based ICT in the **First Mile** project also offered clear advantages over existing systems, and this has been a primary reason for the project's success among its end-users. The collection of information on market prices and opportunities for market sales traditionally required villagers to travel to markets, which can be time consuming, expensive, and involves opportunity costs. The use of mobile phones significantly reduces transaction costs for villagers, while at the same time providing high quality, timely and easily-updated market intelligence information. The training of 'market spies' in the skills of negotiation and marketing further enhanced the relevance of the system, enabling higher quality price information to be reported and market spies to make deals with wholesalers and consumers, while remaining in contact with villagers by mobile phones.

3.2.2 Cost effectiveness and affordability

The cost effectiveness of mobile phone-based ICT applications, and their affordability among end-users, are further important determinants of their relevance and appropriateness. Mobile phone-based ICTs, in general, offer the potential for services to be redesigned in more cost-effective ways, which, for example, may make services more relevant to lower-income individuals and may enable services to be expanded to improve geographical coverage.

Such advantages are frequently highlighted in connection to m-banking services, which, it is argued, offer the potential to extend formal banking services to poorer and more rural members of society who have traditionally been overlooked by banks due to the increased costs of extending the banking branch network to cover them and due to their generally lower rate of savings.

On the issue of the cost of m-banking services, the available evidence suggests that they are cheaper than equivalent traditional banking services, although the price advantage may not be as wide as was initially anticipated. In 2008, for example, CGAP predicted that branchless banking could offer basic banking services to clients at a cost of at least 50 percent less than what it would cost to serve them through traditional channels (Ivatury and Mas 2008). This is because branchless banking leverages existing infrastructure (agent shops) and equipment (in many cases, low-end mobile phones).

However, research in 2010 by CGAP suggests that m-banking services are indeed cheaper than the equivalent banking services, but that the differences may not be as large as might be expected. The research suggests that branchless banking is particularly cheap (50% cheaper) if clients use it for medium-term savings and bill payment, but that banks can actually be cheaper than m-banking for short term safekeeping services.

Part of the reason why the difference in prices between m-banking and equivalent banking services is not greater might be explained by the higher than expected costs in establishing m-banking networks, advertising and in paying agent commissions that have been incurred by service providers. Nevertheless, m-banking does offer savings to its users beyond savings in fees charged by the provider; they also offer significant savings in opportunity and transactions costs which are harder to quantify. For example, Safaricom in Kenya estimates that 47 percent of M-PESA clients save an average of three hours in transport time and US$3 in transport costs per transaction.

In addition, low income users of m-banking services tend to incur lower fees from providers when using m-banking services than they do when using traditional banking services. Banks usually charge fixed fees irrespective of the size of the transaction. Branchless banking providers, by contrast, typically charge tiered or percentage-based fees for many transactions. So, the lower the transaction value, the cheaper branchless banking will be compared with banks.

Finally, innovations to existing m-banking models can make services more cost effective for providers, agents and users. In the Philippines, for example, the Smart Money m-banking service completely eliminated the use of scratch-off cards for the loading of airtime and balance value in favour of the electronic loading of value. This led to considerable benefits, such as reducing the security risk and associated expense of card transport. The service provider passed some of the cost savings on to merchants in the form of larger commissions. This has had the advantage of attracting smaller stores into the network of merchants, including in poorer and geographically remote regions. Since electronic airtime can be loaded in smaller denominations (as low as US$ 0.21), it has also made the service more attractive to lower-income Filipinos.

Beyond m-banking, the more cost effective are mobile phone-based ICT solutions, and the more cost effective they are in relation to comparable existing systems, the more relevant and appropriate they are. In the Texting With A Purpose and Child Nutrition Surveillance projects, for example, the mobile phone-based ICT applications which were adopted were successful because they offered significantly more cost effective alternatives to existing systems. In the Child Nutrition Surveillance project, in particular, the mobile phone-based ICT application offered significant cost advantages over the existing system for data collection, which is based on cost and labour-intensive national surveys of child nutrition.

3.2.3 Reach and appeal

A key question over the relevance and appropriateness of m-banking services is the extent to which advantages in terms of cost and accessibility are translated into increased take-up by unbanked and lower income people. As with the evidence on the cost of m-banking services, the available evidence on the penetration of m-banking services among unbanked and lower income members of society suggests that their reach is indeed broad, but not, as yet, as broad as had initially been predicted.

The evidence suggests that m-banking has been particularly successful in early pioneering countries, such as in Kenya (45 percent of adult population are now registered for M-Pesa vs. 23 percent who have a bank account) and Brazil (75 percent of population now use branchless banking agents vs. 43 percent who have a bank account). However, this high level of success has not been replicated in every case. For example, a 2008 report by CGAP estimated that less than 10 percent of all branchless banking clients are poor, new to banking and use the service for activities other than paying bills, purchasing airtime, or withdrawing government cash benefits (Ivatury and Mas 2008).

This does not necessarily mean that branchless banking can be conclusively judged to have a poor track record in financial inclusion. As CGAP (2010) point out, the data suggests that, despite rapid growth, m-banking services may need more time to reach the unbanked and poorest constituents of society. Even M-Pesa (which is now regarded as one of the more inclusive services) initially struggled to reach the poor and unbanked. A survey in 2008 revealed that the average M-Pesa user at the time was twice as likely to have a bank account, was wealthier, more literate and better educated than non-users. The reach of the service has since expanded rapidly.

Focusing on the ability of m-banking to reach the unbanked also misses the appeal of m-banking to the poor ***under***banked constituents of society who nominally have access to formal financial services but who find the quality of service falls short either in cost, convenience, security, or functionality. FSD in Kenya, for example, reports that 92 percent of Kenyan bank clients also resort to the use of at least one informal financial instrument because they find the service offered by the formal financial product lacking in some way (FSD Kenya, 2009).

Finally, the data also shows that branchless banking providers using m-banking are able to expand their reach to the previously unbanked at least as quickly as fast as the micro-finance institutions (MFI) have. For example, in Kenya and the Philippines branchless banking has on average 79 percent more active, previously unbanked clients than the largest MFI in the same country has among its microcredit clients. The services offered by MFIs and branchless banking service providers are not always directly comparable, however, and further research is needed on how branchless banking networks perform in more markets.

Beyond m-banking, the reach and accessibility of mobile phone-based ICTs has played a key role in rendering other types of services more relevant and appropriate to their intended purpose and end-users. In the Philippines, for example, the PhilRice FTC demonstrates the potential for mobile phone-based ICTs to enable previously expensive, resource-constrained and geographically-limited agricultural extension services to be rapidly extended to more remote populations.

In a similar manner, the Text 2920/117 service enables citizens anywhere in the country to report cases of wrongdoing by police officers. The service is not only more accessible geographically but, like other mobile phone-based ICTs, it is gender neutral and potentially offers scope for improving access by women. It is also anonymous which has encouraged increased reporting of wrongdoing.

Nevertheless, the case of the Text 2910/117 service also demonstrates that while the accessibility of mobile phone-based ICTs may make services more relevant, it may also

have unintended consequences, especially where the introduction of mobile phone-based ICTs outpaces reform of the underlying regulatory framework. The system's anonymity greatly encouraged increased reporting of wrongdoing but it also led to a significant amount of false reporting, while also leading to problems of insubstantial evidence in cases where SMS reports of wrongdoing led to the criminal investigation of wrongdoing. At the time of introduction, the Philippines did not have laws against the sending of false SMS; the experience of false reporting in the Text 2910/117 service led to the later introduction of such legislation.

3.2.4 Range of services offered and functionality

The type and range of services offered by mobile phone-based ICT applications, and their overall functionality, play an important role in determining their appropriateness and relevance, especially in reaching poorer members of society.

As noted above, **M-Pesa** initially had relatively poor uptake among the poor and unbanked. One conclusion to be drawn from this experience is that m-banking services have to offer a wider range of services beyond cash transfers and electronic payment (for example, short-term loans and short-term safe keeping) in order for them to be more relevant to poor constituents of society and for them to contribute further to the challenge of reducing financial exclusion. In 2010 Safaricom launched **M-Kesho**, a service which builds on the m-banking platform of M-Pesa and is linked to the financial products of Equity Bank.

In other mature m-banking markets, such as Brazil, branchless banking providers and third parties are also responding to client demand for a broader range of financial services and are linking new products such as loans and insurance to the basic electronic wallet or pre-paid card. Even in mature markets such as Brazil and Kenya, however, such innovation in the initial m-banking model has taken several years to develop. This experience suggests that a process of rapidly testing new products to determine if they are appropriate for low income clients is required.

There are further examples which demonstrate the need to carefully consider service functionality in the design of mobile phone-based ICT applications. The **Text 2920/117** service in the Philippines was among the first to enable citizens to use mobile phones to report instances of wrongdoing by police officers. At the outset, the system had limited functionality with regard to progress reporting and feedback: no evidence or statistics were published on how complaints were resolved, or on charges brought against police officers. Such limitations adversely affected the service's impact on police behaviour and therefore its appropriateness in performing its key function to reduce wrongdoing and its relevance to citizens.

3.2.5 Technical factors and cost of operation and maintenance (O&M)

The relevance and appropriateness of mobile phone-based ICT systems, both to end users and to operators, is also affected by technical factors and the cost of ongoing operation and maintenance. Such considerations also have a significant impact on the replicability, scalability and sustainability of mobile phone-based ICT systems which is discussed further below.

In the **First Mile** project, the use of mobile phones to enhance information gathering and exchange on market prices and intelligence used familiar technologies including SMS and voice calls. It was also flexible and pragmatic and integrated with other forms of communication, such as village notice boards and a website.

Difficulties can be encountered, however, when mobile phones are used to undertake new and unfamiliar types of activities, and where the ICT application used is more complex and skill-intensive. In the **Texting With A Purpose** project, for example, the closed response form used to enter data on standard mobile phones required pre-coded data to be entered very accurately. The system suffered from problems of user-friendliness and had a high sensitivity

to errors in data entry. This proved challenging in a context in which literacy and overall I.T. knowledge is low and required the donor to provide continuing technical support and training.

Technical factors external to the mobile phone-based ICT system can also serve to undermine its relevance and appropriateness. In UNICEF Malawi's project to improve **child nutrition surveillance**, mobile phone network connectivity problems in rural areas undermined one of the key benefits offered by the mobile phone-based ICT system: the automatic feedback loops which offer close-to-real time data analysis and feedback on required further care to public health workers in the field. Periodic interruptions in the electricity supply also affected this system by shutting down the central RapidSMS server.

With regard to O&M costs, mobile phone-based ICT systems often have the advantage not only of being cost effective (see above), but also of spreading operational costs among users. For example, the costs of sending information by SMS to centralised servers in the **PhilRice FTC** and **Text 2920/117** service in the Philippines are borne by the users themselves. The Text 2920/117 service also has the advantage of being separate from existing police networks and therefore does not swamp them or add to their O&M costs. In the First Mile project, O&M costs are recovered from the additional profits achieved by farmers through higher selling prices as a result of the mobile phone-based ICT system.

Nevertheless, mobile phone-based ICT applications can incur difficulties with regard to O&M costs. As noted above, the Texting With A Purpose project encountered unforeseen demands for continuing technical support and training. In the **Jokko Initiative**, the cost of operation of SMSForums is very high. In order to encourage use of the service, the project covers the costs of re-broadcasting text message sent to these virtual forums. These costs have proven to be very high, however: during the pilot phase users paid on average 10 CFA francs (~ 2 US cents) to send messages to the SMSForum. The Initiative paid the cost of re-sending the message to the over 200 users on each forum, or the equivalent of about USD 5 per message. This resulted in a total cost of USD 2,870 for the 570 messages sent during this pilot. If the project was to expand this service nationwide in Senegal, it is estimated that the costs could easily exceed USD 2 million per year.

4. Replicability, scalability and sustainability

Summary: replicability, scalability and sustainability of mobile phone-based ICTs

- Key factors which should be considered in project design, which affect the sustainability, replicability or scalability of mobile phone-based ICTs include:
  - Dependence on donor support – mobile phone-based ICTs are frequently affordable and cost-effective, and hence sustainable once donor support is withdrawn, but this is not always the case;
  - Regulatory environment – demands for new or differentiated services, for example, may require regulatory reform;
  - Relevance to the needs of users – whether or not services are relevant to the needs of users is a crucial factor in determining their sustainability. The design and functionality of mobile phone-based ICTs may need to evolve over time to meet these needs;
  - Business model – the business model adopted in commercial services can play a key role in determining their replicability and scalability and their ability to reach the lowest income members of society; and
  - Technical issues – problems such as poor network coverage and unpredictable electivity supply can undermine the added value of mobile phone-based ICTs and affect their replicability and scalability.

This section draws once more on the case study material to highlight some of the key factors which affect the replicability, scalability and sustainability of mobile phone-based ICT systems, factors which are important to consider in project design.

4.1 Dependence on donor support

Many mobile phone-based ICT systems are sustainable once the support of donors is withdrawn, primarily because they are often affordable for service providers and users alike and are frequently more cost-effective than alternatives systems. This is especially the case with the **PhilRice FTC** and **Text 2920/117** service, whose operation is based on the sending of SMS, which is a very low cost form of communication in the competitive mobile phone market in the Philippines. As discussed above, the model adopted for these services also spreads the costs of operation, with the costs of sending SMS into the services borne by the users themselves. The design of the **First Mile** project is also technically and financially sustainable, with the costs of O&M of the mobile phone-based ICT being supported by the extra profits farmers achieve by selling products at higher prices.

The ongoing costs of O&M should be carefully considered in the design of projects, however, as they can undermine the sustainability of mobile phone-based ICT applications once donor support is withdrawn, as well as the potential to scale-up the use of the mobile ICT application. The **Jokko Initiative** provides a key example in this regard: the model of SMSForums provided an innovative 'virtual' application through which project participants could practice and sustain their literacy skills and communicate with the wider community. The model is highly dependent on donor support, however, and this significantly undermines its scalability.

The child nutrition surveillance project in Malawi and **Texting With A Purpose** in India both also highlight the importance of considering carefully the requirement for ongoing technical support and training in O&M. While the models adopted in these projects are not necessarily unsustainable, they have required more technical support and training than was initially

envisaged. A key lesson learned in the child nutrition surveillance project, for example, is the importance of high quality and continuing training at each administrative level to support the continuing operation of the RapidSMS system.

4.2 Regulatory environment

The regulatory environment in which mobile phone-based ICTs operate can be an important determinant of their sustainability and replicability. For example, initial difficulties in reaching the poorer and unbanked members of society, and the demand for m-banking models to evolve into broader transactional platforms capable of delivering a wider range of financial services, prompted the Central Bank of Kenya to review the underlying regulatory framework for the sector and led to regulatory reforms to enable non-bank platforms and mobile services such as **M-Pesa** (and the new M-Kesho service) to act as formal channels for deposit taking for the first time.

4.3 Relevance to the needs of users

The relevance of a mobile phone-based ICT to the needs of its users is also an important factor in its overall sustainability. The **First Mile** project, for example, has been highly successful because it produces information which is highly relevant to farmers' needs (such as market intelligence information on pricing, sales opportunities and costs of transport). The model of mobile phone-based ICT adopted in the project has been able to do this because information is generated by members of the community themselves and the system is sufficiently flexible to enable it to evolve in response to the changing informational needs of its users.

The **PhilRice FTC** has also been successful because it is highly relevant to the needs of its users and able to respond quickly to their individual requests for information. Nevertheless, with specific relevance to mobile phone-based ICT extension services for agriculture, users of the system provided the following recommendations for the further improvement of the system:

- 'Text tips' should be sent to users as often as possible;
- Texts on techniques to improve farming activities are very useful to users;
- 'Text tips' addressed to extension workers are a valuable source of information to share with farmers;
- Targeting of appropriate rice tips to farmers in different regions based on the type and growth of rice plants found there is very useful;
- The service should operate on Saturdays and Sundays;
- Response times should be as short as possible; and
- The service should be advertised nationally to increase its use.

Mobile phone-based ICT applications may also need to evolve over time in order to enhance their relevance among users and in order to improve their reach and scalability. For example, the case of **M-Pesa** demonstrates that poorer members of society may have different priorities from other constituents of society and that mobile phone-based ICT applications may therefore need to evolve and offer new services and functionality in order to be more relevant to the needs of these people.

4.4 Business model

The business model adopted by commercial projects employing mobile phone-based ICT plays an important role in their scalability and sustainability. The business model adopted by **M-Pesa**, for example, holds general lessons for extending access to financial services to poorer members of society and highlights the relevance of a usage rather than a float-based system to operate m-banking services. Rather than distinguishing between profitable and unprofitable customers based on the size of their account balances and ability to absorb credit, and thereby frequently overlooking poor customers, mobile banking models such as M-Pesa have made it possible to reach poor customers by adopting a usage-based revenue model, based on selling pre-paid airtime in potentially small increments with each transaction profitable on a stand-alone basis.

Smart Money in the Philippines uses a similar business model, which, as noted above, has

been rendered more relevant to lower income clients and sales agents in remote regions by the efficiency savings introduced through the wholly electronic charging of airtime and electronic value.

4.5 Technical issues

Scalability and replicability can also be affected by technical issues both internal and external to the project. **The Texting With A Purpose** project encountered technical issues with regard to the technical complexity and sensitivity of the mobile phone-based ICT application with regard to data entry. Initially, the **Jokko Initiative** also encountered difficulties related to the entering of information by users because the service did not support local language characters. The project overcame this problem by allowing third-party translators to build out both the web and SMS interface to support any language, which made the RapidSMS platform more appropriate to the context in which it was being used and enhanced scalability.

UNICEF Malawi encountered technical issues external to the project in which some of the more innovative features of the **child nutrition surveillance project**, the features where the mobile phone based ICT application could add most value, were undermined by network connectivity issues and unpredictable electricity supply. Such issues should be considered in the design of projects that utilise mobile phone-based ICT.

5. Summary of appropriateness and relevance of mobile phone-based ICT in case study projects

The below table provides a summary of the appropriateness and relevance of the use of mobile phone-based ICT in the case study projects reviewed in this report. In doing so it draws on the key determinants of replicability, scalability and sustainability developed in Section 4 above.

Project	Donor dependence	Regulatory environment	User relevance	Business model	Technical complexity
PhilRice Farmers' Text Center	**	***	***	N/A	***
The First Mile Project	***	***	***	N/A	***
Texting with a purpose	**	***	***	N/A	**
M-Pesa	N/A	**	**	***	***
Child Nutrition Surveillance	***	***	***	N/A	**
Jokko Initiative	*	***	***	N/A	***
Text 2920/117	***	**	**	N/A	***

Explanation of colour-coded categories used:

No difficulties encountered in this aspect – the intervention is appropriate and relevant to its context and sustainable in this area	***
A few difficulties encountered in this aspect which were/could be corrected through remedial action – the intervention is generally appropriate and relevant to its context and sustainable in this area	**
Several difficulties encountered in this aspect which have not been addressed – the intervention may not be appropriate and relevant to its context and may encounter problems of sustainability in this area	*

6. References

Further information on the case studies can be found at the following locations:

PhilRice Farmers' Text Center
Stoix Nebin S. Pascua, Ronan G. Zagado, Olive Rose M. Asis, Oliver C. Domingo, and Jennylene S. Maloles, (2010), "Enhancing knowledge networking through short messaging service: the Farmers' Text Center experience", *Philippine Journal of Crop Science* (Mar 2010).

The First Mile Project
www.ifad.org/events/wsis/phase2/factsheet/e.pdf

www.ifad.org/rural/firstmile/FM_2.pdf

www.ifad.org/rural/firstmile/index.htm

Texting with a purpose
http://mobileactive.org/case-studies/texting-purpose-catholic-relief-services-usemobiles-india-track-health

M-Pesa
www.safaricom.co.ke/index.php?id=745
Mas, I and Radcliffe, D, (2010), "Mobile Payments Go Viral: M-Pesa in Kenya"
http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA_Kenya.pdf

Child Nutrition Surveillance
www.unicef.org/infobycountry/usa_47068.html

UNICEF Malawi, (2009), "Using Mobile Phones to Improve Child Nutrition Surveillance in Malawi"
http://mobileactive.org/files/file_uploads/unicef_Malawi_CNS.pdf

Jokko Initiative
www.jokkoinitiative.org

http://mobileactive.org/how-tostan-using-mobiles-literacy-and-communityempowerment

Beltramo, Theresa and Levine, David, (2010), "Do SMS Text Messaging and SMS Community Forums Improve Outcomes of Adult and Adolescent Literacy Programs? Evidence from the Jokko Initiative in Senegal"
www.tostan.org/data/images/project%20jokko%20final%20report%20september%202010.pdf

Text 2920/117
www.egov4dev.org/mgovernment/resources/case/text2920.shtml

Further general references include:
CGAP (2010) "Branchless Banking 2010: Who's Served? At What Price? What's Next?"
www.google.co.uk/url?sa=t&source=web&cd=1&sqi=2&ved=0CBYQFjAA&url=http%3A%2F%2Fwww.cgap.org%2Fgm%2Fdocument-1.9.47614%2FFN66_Rev1.pdf&ei=oZALTe3UEYW7hAfptvj7Cw&usg=AFQjCNHtXGRihCxQpcRWusB9DNgwq8TAtQ

DFID (2009, February 12). "Douglas Alexander sets out how branchless banking can help the poorest people".
www.dfid.gov.uk/Media-Room/Speeches-andarticles/2009/Douglas-Alexander-sets-out-how-branchless-banking-can-help-the-poorest-people/

DFID (2006). The enabling environment for mobile banking in Africa (by Porteous, D.). DFID

Ivatury, Gautam, and Ignacio Mas (2008), "The Early Experience with Branchless Banking." Focus Note 46. Washington, D.C.: CGAP.

Kumar, Anjali, Nair,A., Parsons, A., & Urdapilleta, E,. (2006). Expanding bank outreach through retail partnerships: correspondent banking in Brazil, Working Paper No. 85.
http://siteresources.worldbank.org/INTTOPCONF3/Resources/363980Retail0p101OFFICIAL0USE0ONLY1.pdf

Ratha,D., Sanket & Vijayalakshmi, K.M. (2009). Remittance flows to developing countries are estimated to exceed $300 billion in 2008.
Found at: Migration, remittance and development blog: http://peoplemove.worldbank.org/en/content/remittance-flows-to-developing-countries

Sultana, Rasheda (2009), "Mobile banking: Overview of Regulatory framework in emerging markets", 4th Communication Policy Research, South Conference, Negombo, Sri Lanka.
www.mobileactive.org/files/file_uploads/SSRN-id1554160.pdf

Annex I. Case studies of regulation for m-banking in Kenya and the Philippines

1) M-banking regulation in Kenya

Kenya has witnessed the rapid growth of its own highly successful m-banking services since the launch of M-Pesa in September 2007. Safaricom and Vodafone (the parent company) were required to seek authorization from the Central Bank of Kenya before launching the service. In evaluating the proposal, the Financial Institutions Supervision Department (FISD) of the Central Bank was primarily concerned with the question of whether the service would stretch or break the rules of the business of banking.

The regulatory framework which has emerged to support the introduction on m-banking in Kenya is considered robust and pragmatic. Rather than introduce entirely new banking regulation, or significantly amend the existing regulatory environment, the initial model adopted for m-banking is non bank-based and precautionary measures were put in place to ensure that the services did not infringe upon the banking services regulatory framework provided for under section 2(1) of the Banking Act. In particular, the proceeds from issuing e-money are held by M-Pesa Trust Company Limited in trust for the clients in a pooled account from the Commercial Bank of Africa.

In the model adopted, any interest earned on this pooled account cannot benefit Safaricom (as this would constitute 'banking business'), and any customer claims against M-Pesa Trust Company arising from negligence or intentional wrongdoing by the trust company or by Safaricom will be covered by Safaricom. In addition, caps on the maximum account balance (approximately US$ 750) and a maximum transaction size (approximately US$ 530) mitigate against potential risks for the Central Bank of Kenya because they limit the risks of money laundering and the amount any individual customer could lose in case of insolvency.

2) M-banking regulation in the Philippines

The Philippines has been recognised as an early innovator and leader in the area of m-banking with its Smart Money and G-Cash services and the Central Bank of the Philippines (BSP) has been praised for adopting a pragmatic approach to the regulation of the emerging sector, which is flexible but hands-on where and when required. In general, the approach of BSP is one which "follows the market", which finds ways to permit innovation within safe, sound and prudent standards.

Since 2000, The Philippines has introduced new and amended legislation which have provisions for m-banking. The general banking law of 2000 recognised micro-finance as a legitimate banking activity and the Electronic Commerce Act of 2000 ('E-Commerce Act') recognised the validity of electronic transactions and signatures and provides the basis for the prosecution of electronic crime. Both of these laws cover mobile and electronic banking risk management, security procedures, internal controls, anti-money laundering (AML) regulations, know-your-client (KYC) requirements and consumer protection. The BSP also created a core IT supervisory team to supervise effectively and remain up-to-date with the latest developments in mobile and electronic banking.

Using such legislation as a starting point, BSP has supported the development of two different arrangements for two different mobile operators, which are more bank-based and less bank-based respectively. In one model, banks are permitted to outsource a substantial range of activities to a mobile operator, Smart Communications (Smart), via a system of pre-paid accounts. In the second model, a subsidiary of a mobile operator, Globe Telecom (Globe), offers virtual stored-value accounts which allow mobile phone customers to make payments and money transfers. The

subsidiary, G-Xchange Inc (GXI) is regulated as a remittance agent, which permits a non bank-based model also using pre-paid accounts.

As CGAP (2010) argue, these arrangements for Smart and GXI have been successful largely because of the flexible and creative approach adopted by BSP. Although, as noted above, legislation existed in 2000 which could provide a legal basis for the adoption of m-banking, the legislation had not been drafted specifically with the development of the sector in mind. BSP has therefore chosen a pragmatic approach which has identified and overcome challenges in an ad hoc manner as they have emerged. With the two service providers, BSP has worked out approaches to issues including the outsourcing of account maintenance, treatment of the float from e-money issuance and the status of Smart Money agents. This provided the space early on for the companies to launch their innovative products, while enabling identified risks to be overcome prudently.

BSP has also acted in a flexible way to address other issues during the development of m-banking in The Philippines. For example, the ability to convert cash to electronic value is a vital component in m-banking in a largely cash-based economy. Yet until 2009, the network of places where GCash and Smart Money customers could do so was limited, with only around 5,000 agents who were able to perform the functions of cash in and cash out for both companies. The existing legislation for banking was the primary factor which had reduced the growth of the agent network: initially agent registration required the attending of a one-day training which was not widely available outside Manila. In 2008, BSP amended this requirement, however, and has allowed Smart Money and GXI each to conduct its own training.

Please address comments and inquires to:
Investment Centre Division
Food and Agriculture Organization of the United Nations (FAO)
Viale delle Terme di Caracalla – 00153 Rome, Italy
Investment-Centre@fao.org
www.fao.org/tc/tci

Report No. 2 – January 2011