



AGRICULTURE GLOBAL PRACTICE TECHNICAL ASSISTANCE PAPER

# SUPPORTING WOMEN'S AGRO-ENTERPRISES IN AFRICA WITH ICT

**A FEASIBILITY STUDY IN ZAMBIA AND KENYA**

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# ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ACF	Agricultural Consultative Forum
BNPP	World Bank–Netherlands Partnership Program
CBA	Cost Benefit Analysis
CCK	Communication Commission of Kenya (now the Communications Authority of Kenya)
CIG	Common Interest Groups
CWG	Common Working Groups
EDGE	Enhanced Data rates for GSM Evolution
FAO	Food and Agriculture Organization
GIDD	Gender in Development Division
GPRS	General Packet Radio Service
ICT	Information and Communication Technology
ICT-WE	Pilot Project Zambia and Kenya
iDE	International Development Enterprises
IDSP	Irrigation Development and Support Project
IFAD	International Fund for Agricultural Development
ISP	Internet Service Provider
ISR	Implementation Status and Results Reports
KAPAP	Kenya Agricultural Production and Agribusiness Project

Acronym	Definition
K Sh	Kenya shillings
MAL	Ministry of Agriculture and Livestock (Zambia)
MIS	Management Information System
NAIS	National Agricultural Information Service (Zambia)
NGO	Nongovernmental organization
SAPP	Smallholder Agri-Business Promotion Program
SMS	Short Message System
TTL	Task Team Leader
UPS	Uninterrupted power supply
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data
VSAT	Very Small Aperture Terminal
ZANACO Bank	Zambia National Commercial Bank
ZICTA	Zambia Information and Communication Technology Agency
ZNFU	Zambia National Farmers Union





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This report was developed and managed by Eija Pehu (Task Team Leader [TTL], GFADR) and Pirkko Poutiainen (co-TTL) from the Agriculture Global Practice (formerly Agriculture and Environmental Services Department) who provided continuous guidance throughout the project. It was written by an external consultant team comprised of Sandra Gilissen, Eric Sommeling, Bwalya Penza-Chona, and Lucy Kirui of IMANI Development Consultants, and Pirkko Poutiainen, Terhi Havimo, and Marialena Vyzaki of the World Bank. Indira Ekanayake (Senior Agriculture Economist, GFADR) and Andrew Mwihia Karanja (Senior Agriculture Economist, GFADR) provided valuable comments during all stages of implementation. The support and contributions of Brenda Boney Achieng of IMANI Development Consultants are gratefully acknowledged, as is the editing of the report by Kelly Cassaday and management of the production of the report by Jim Cantrell (Communication Analyst, ECRGP). This project was administered by the Africa Region, and the support of Markus Goldstein (Practice Leader, AFRCE) and Katherine Manchester (Consultant, AFRCE) is gratefully acknowledged.

This study aimed to understand whether and how information and communication technology (ICT) could be used to support agro-enterprises run and managed by women in Kenya and Zambia. The research was conducted in close conjunction with two World Bank-supported agricultural projects, the Irrigation Development and Support Project (IDSP), implemented by the Ministry of Agriculture and Livestock (MAL) in Zambia, and the Kenya Agricultural Productivity and Agribusiness Project (KAPAP), implemented by the Ministry of Agriculture, Livestock, and Fisheries.

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The case studies would not have been possible without the collaboration of IDSP and KAPAP participants in Zambia and Kenya who were interviewed during the surveys,

including district and county administrators, extension officers, ICT developers, service providers, community leaders, representatives of nongovernmental organizations (NGOs), private sector staff, and members of the

communities and producer groups in the targeted areas. The team would like to express their gratitude to the IDSP and KAPAP staff, who showed great commitment and dedicated considerable time to this assignment.

# EXECUTIVE SUMMARY



A new generation of information and communication technologies (ICTs) is finding a small foothold among poor, small-scale farmers in developing countries. Even so, many barriers still prevent poor rural people from accessing, using, and benefiting from new ICT tools and platforms, and those barriers are arguably higher for rural women. The relationship between gender and agriculture has been studied intensively over the years, and many agricultural interventions now include gender as a cross-cutting issue or “mainstream” gender throughout their operations. Studies of the relationship between gender and the use of ICTs in agriculture have started to appear only quite recently, however.

The Africa Region of the World Bank views ICTs as potentially transformative technology for rural development and seeks to incorporate the use of ICTs throughout its portfolio of projects. The present study was designed to examine the feasibility of integrating ICTs into two large investment programs: the Irrigation Development and Support Project (IDSP) in Zambia and the Kenya Agricultural Productivity and Agribusiness Project (KAPAP). The specific goal was to examine how ICT-based interventions might be designed to strengthen women’s participation in commodity value chains under the two projects.

IDSP, implemented by the Ministry of Agriculture and Livestock in Zambia, was officially launched in November 2012. During the field research for this study, IDSP was conducting its own feasibility studies, discussing the land consolidation and resettlement process for developing the irrigation schemes, establishing public-private partnerships related to the schemes, and creating Participatory Site Committees. In contrast, KAPAP, coordinated by the Ministry of Agriculture, Livestock, and Fisheries, was in its second phase (2010–14) of operation, scheduled to end in December 2014. IDSP operates at three sites: Mwomboshi (Chibombo District, Central Province); Lusitu (Chirundu District, Lusaka Province); and Musakashi (Mufulira District, Copperbelt Province). KAPAP operates in 20 counties, where it supports 4,216 Common Interest Groups (CIGs) in 36 commodity value chains, with the goal of aggregating those groups into larger farmer cooperatives or societies. This study focuses on three of those counties: Makueni, Kwale, and Gucha/Kisii.

# METHODOLOGY

To collect information about the projects, target groups, gender issues, information needs, and the current status of ICTs in agriculture in both countries, the study team reviewed the literature on gender and ICTs in agriculture and met with IDSP and KAPAP staff, ICT practitioners, service providers, district government officials, NGOs, and World Bank staff. The team inventoried and analyzed the ICT platforms and tools available in both countries. The team also gathered information through field surveys among farmers and entrepreneurs in Zambia (Lusitu, Musakashi, Mwomboshi) and Kenya (Makueni, Kwale, and Gucha/Kisii), and held focus group discussions with women and men farmers at those project sites.

# FINDINGS FROM THE LITERATURE, INVENTORIES, AND SURVEYS

In both countries, data on the quality and impact of using ICT tools in agriculture are quite scarce. A major finding from the literature review and ICT inventory is that numerous ICTs have been developed for small-scale farmers in Kenya, but very few have been

developed in Zambia, and no ICT tools in these countries have been developed specifically for women farmers. Very few of the ICT tools for small-scale farming are commercial products. Most have been created with funding from development projects and donors, so their sustainability is a major issue; with very few exceptions, the use of most of these tools ceases at the end of a project.

Demand for extension information continues to be high, especially among women, whose access to agricultural information has so far been limited. Agricultural extension officers are keen to receive training on how to use ICTs in their work and are eager to adopt them to reach more farmers more cost-effectively.

# FINDINGS FROM THE PROJECT SITES

Given the IDSP's focus on irrigated agriculture, the surveys concentrated on the vegetable production value chain in Zambia. In Kenya, the surveys in Makueni, Kwale, and Gucha/Kisii examined the value chain for indigenous poultry, in which women's participation is high. Table S.1 summarizes the findings.

**TABLE S.1. FEATURES OF THE FARMING COMMUNITIES AND VALUE CHAINS IN SELECTED IDSP AND KAPAP SITES, ZAMBIA AND KENYA**

IDSP, Zambia	KAPAP, Kenya
<ul style="list-style-type: none"><li>• The majority of farmers (male and female) in the three IDSP sites are subsistence farmers, heavily involved with maize production. Some vegetables are also produced in all sites on a small scale.</li><li>• Livestock (cattle and small livestock) is relatively important in Lusitu, in comparison to the Mwomboshi and Musakashi sites.</li><li>• There are very few women entrepreneurs in the three IDSP sites, and they mainly sell produce locally when there is surplus production.</li><li>• There are very few organized groups (women, men, or mixed) in Lusitu, while the number is higher in Mwomboshi. Musakashi has the highest number.</li><li>• The majority of the groups are not very active or organized; often they are formed to access (government) subsidy programs.</li></ul>	<ul style="list-style-type: none"><li>• All groups KAPAP works with are mixed groups, with groups in the poultry value chain having a relatively large number of female members.</li><li>• In the poultry value chain in the three counties, the majority of farmers (male and female) are small-scale producers who do not sell on a large scale.</li><li>• Farmers generally sell indigenous poultry and acquire their production inputs individually, but some well-organized groups sell birds and acquire inputs collectively.</li><li>• Groups are supported by private service providers, contracted and paid by the farmer groups with funds provided by KAPAP.</li></ul>

**TABLE S.1.** FEATURES OF THE FARMING COMMUNITIES AND VALUE CHAINS IN SELECTED IDSP AND KAPAP SITES, ZAMBIA AND KENYA (*Continued*)

IDSP, Zambia	KAPAP, Kenya
<ul style="list-style-type: none"> <li>Electricity provision through the national grid is virtually absent in the three sites, and very few farmers have electricity through other means (solar).</li> <li>One of the main challenges for traders is poor road network in all sites, especially during the rainy season.</li> <li>The literacy level is low in all sites, with higher illiteracy levels among women.</li> <li>The mobile phone network is good in all three sites.</li> </ul>	<ul style="list-style-type: none"> <li>Electricity is available in the counties and is accessed by (some) Common Interest Groups (CIGs) but infrequently by individual farmers.</li> <li>The main challenges for the poultry value chain are lack of access to affordable feed, markets, and credit and inconsistent prices.</li> <li>The literacy level in general is higher than in Zambia, also among women, although more men than women can read and write.</li> <li>The mobile telephone network is good in the three selected counties.</li> </ul>
<ul style="list-style-type: none"> <li>Fewer women than men own a phone.</li> </ul>	<ul style="list-style-type: none"> <li>An average of 70 percent of group members own a mobile phone, and women have their own phones.</li> </ul>

Source: Authors.

Note: Surveys conducted in Lusitu, Musakashi, Mwomboshi (Zambia) and Makueni, Kwale, and Gucha/Kisii (Kenya). IDSP: Irrigation Development and Support Project; KAPA: Kenya Agricultural Productivity and Agribusiness Project.

## THE INTERVENTION CONCEPT IN ZAMBIA

The key need identified in Zambia was for female farmers to obtain technical information to improve agricultural production and processing. Women farmers and entrepreneurs also need to develop stronger links with service providers—not only providers of extension advice but providers of advice on managing farmer groups and developing robust business models. Communication between technical experts and farmers needs to be interactive, to include a range of service providers (not extension alone), and include IDSP staff. An intervention using ICTs to address these issues would focus on *facilitating the creation of a network of information exchange among stakeholders, in which groups of women farmers and entrepreneurs are the central source of demand for the information being shared.*

After assessing alternative technologies (smartphones and tablets, for example) in light of context-specific factors (discussed in the next paragraph), the team concluded that tablet devices were the best alternative for lead female farmers to liaise with the IDSP site liaison officers, extension officers, and other service providers. The lead farmer would be a woman within the group with sufficient literacy to use the tablet as a communication tool to reach a network of technical and price information providers and output market actors such as traders and

processors. Compared to a regular mobile phone, a tablet can store, manage, share, and display large amounts of information. A number of context-specific factors determined the selection of tablet devices as the ICT tool of choice:

- » **Information needs.** Women farmers are mainly involved in maize production in the IDSP sites, but they are starting to enter vegetable production. Given that vegetable production is likely to increase when the irrigation schemes start to operate, women farmers will benefit from information provided now on vegetable crop management practices, prices, and potentially profitable interactions with other actors in the value chain.
- » **Literacy level.** Certain features make tablets easy to use for people who have limited literacy, including navigation with icons and buttons to access voice and video information. Moreover, information can be shared and stored more accessibly in tablets than, for example, in a smartphone or a computer in a district center.
- » **Mobile phone ownership.** Women in all three sites rarely use mobile phones; when they do, it is not for business. The startup costs are lower for basic mobile phones than for tablets, but future phone use could be more costly, based on the current cost of text messaging in the project areas.

- » **Internet connectivity.** Even though the groups will need to pay to connect to the internet via their tablets, the cost could be supported by the project at first and then gradually paid for by the groups as they earn additional income from vegetable production. Connectivity costs are relative low, at approximately US\$21 per month.
- » **Access to electricity.** Access to electricity will be assured for each household in the IDSP area by the end of the project, but electrification will be gradual. In the meantime, farmer groups without electricity will be provided with solar panels and chargers, which could also be used to charge other devices and generate revenue to offset the groups' costs.
- » **Use and maintenance.** Women's groups and other recipients of devices will be trained to use and maintain them, and the group leaders and designated group members will have clearly defined responsibilities for use and maintenance. In close collaboration with Sofreco—the designated community participation and capacity building provider for IDSP—lead women farmers will learn to use the tablets. Content for the agricultural extension training modules will be developed by the Ministry of Agriculture and Livestock (Zambia) and the Agriculture Research Centres, while the content of the agribusiness training modules will be developed by the IDSP staff working on agribusiness.

A pilot implementation phase of 18 months was designed to set up and test the efficacy of using tablets to provide technical and business information to women's groups. The pilot would be monitored based on a two-pronged approach: (i) monitoring and evaluating actual use of the tablets and the communication network (uptake of the tool) and (ii) monitoring and evaluating the actual results and outcomes achieved by using the tablets and communication network (gauging whether uptake of the tool had positive results).

## THE INTERVENTION CONCEPT IN KENYA

The key need identified in Kenya was for an ICT intervention to focus on *supporting individual poultry farmers and their organizations to develop and implement efficient systems*

*and processes for managing their organizations, production, sales, finance, and communication.* One tool that could meet that need—especially for the larger, more cohesive groups that already engage in commercial poultry production and have formed Limited Liability Companies—is the Poultry Producer Group Management Software developed for TechnoServe Kenya.

The software is an adaption of the successful EasyMa software used in the dairy value chain, where it facilitated the management of Producer Business Group Hubs (companies) that aggregate milk and support small-scale dairy farmers. Implemented in 23 dairy plants, the software was instrumental in introducing efficient, effective financial management of transactions; it increased women's access to information, nurtured management capacity in businesses led by women, and provided gender-disaggregated data on business transactions for decision making as well as monitoring and evaluation.

TechnoServe is attempting to replicate this success with farmers in the poultry value chain. Poultry producers are generally poorer than dairy producers, however, and they are not yet as organized, so it remains to be seen whether the software will be successful and what additional adaptation and capacity building might be needed.

A similar tool, CoopWorks, is a financial and member management information system for farmer associations and agricultural cooperatives. The goal of CoopWorks' developers is to provide a standard software package for affordably automating all activities of agricultural cooperatives. The software includes modules for managing membership, inventory, payroll, shares, cash and banking transactions, and debtors and creditors. Because CoopWorks digitizes all information relevant to the cooperatives' operations, it helps to improve accountability and efficiency, provide information for sound and timely decision making, reduce operational costs, and ultimately increase production. The tool, initially developed for and tested on the dairy and coffee value chains, is now used by more than 40 cooperative societies in Kenya to manage daily operations. Uptake is on the rise, as the tool is being adapted for the maize value chain.

A pilot implementation phase of 18 months would provide hardware (computers, modems, printers, and



Uninterrupted Power Supply [UPS], for example) and software for managing the poultry production operations of three selected CIGs in Makueni County. Members of the CIGs will be trained on the uses, advantages, and disadvantages of the poultry management system. More specific training would be provided to a data entry clerk and selected members of each CIG to ensure that the system is efficiently operated and maintained. An implementation plan has been developed, including the use of the poultry software and close monitoring by the software developers and service providers in the county.

## LESSONS LEARNED

The desk review, field surveys, and focus group discussions with stakeholders demonstrate that the choice of ICT tool depends strongly on the context in which it will be used. Numerous factors influence individuals' ability to gain access to ICTs and use them effectively in agriculture, including connectivity, local capacity, production constraints, value addition and marketing, and the intensity of interaction among stakeholders. Although the groups participating in this feasibility study differ in their specific circumstances, the research offers some general lessons, key elements, and steps for practitioners to consider in designing and implementing ICTs that respond to the specific needs of female farmers and entrepreneurs.

First and foremost, men and women differ in their access to, use of, and need for ICT tools, and it is important to understand this gender difference when choosing and designing ICT systems and tools. At the same time, the primary consideration in enabling poor and disadvantaged groups to benefit from using ICTs is whether the technology is sustainably accessible to them. Before a technology can be designed or promoted for any group, its probable accessibility must be assessed. The choice of an effective, cost-efficient option will also depend on the prevailing policy, regulatory, and business environment.

A number of key elements and steps should be considered in developing and implementing ICT tools that are useful and easily accessible to women (and other groups) in agriculture:

- » **Define the target group and subgroups.**  
For this study, it was essential to identify the

value chains with high levels of participation by women.

- » **Identify the needs of the target group and subgroups.** Establish to what extent ICTs can actually address those needs.
- » **Conduct a value chain analysis and/or describe use case scenarios.** Use case scenarios provide a critical look at potential ICT solutions, because they identify factors that could undermine a technology's effectiveness in the particular context for which it is being designed.
- » **Select or develop the ICT platform/tool.** The review of existing tools and platforms is a difficult exercise that requires highly detailed analysis—a literature review or internet search is never sufficient.
- » **Consult and involve the target group(s) in designing the ICT tool(s) or platform(s).** A practical approach for verifying the suitability of a candidate ICT is to involve target group in designing the tool. The developers will also gain an indication of the training and promotion that prospective users will need and the differences between men's and women's access to the tools.
- » **Develop a business model for developing, promoting, and running the ICT platform/tool.** A financial plan is required to develop an ICT tool or platform, and a longer-term financial strategy is needed to support its continued use. Users should eventually be able to cover the entire cost of the service, once it has enabled them to create new sources of revenue.
- » **Develop a plan that ensures the continuity and sustainability of the tool/platform.** ICT tools can be sustained only when they are economically viable and are used by the target group to address their business needs. The tools should be supported by a profitable organization, such as a private enterprise that has embedded the tools within its activities. Such enterprises usually have the capacity and resources to provide reliable and current information and training, have an interest in updating and further developing the tool, and manifest a long-term commitment to managing the tool.



## **BOX S.1.** A STEP-BY-STEP GUIDE TO INTRODUCING ICT-BASED SOLUTIONS WITH A GENDER FOCUS IN AGRICULTURAL PROJECTS

### **1. Document the characteristics of men and women farmers/members of producer organizations through a gender analysis:**

- Farmer group's level of organization.
- Farmer group's level of activity (regular meetings and other involvement).
- Type of economic activities.
- Literacy level.
- Mobile phone ownership.
- Different areas of the value chain in which the group is engaged.
- Provision of extension services.

### **2. Conduct a needs assessment to identify information needs and constraints, such as:**

- Extension information.
- Group management information (organizational and financial management system, productivity and financial management data).
- Business model training.
- Interactive communication channel for farmers and service providers.

### **3. Select or develop the ICT platform/tool:**

- Conduct a review of ICT tools/platforms available.
- Involve target groups in the selection/design of the ICT tool.

### **4. Identify which provider can provide appropriate content to meet the needs of women farmers:**

- Ministry of Agriculture.
- National Agricultural Research Institute.
- Private sector.

### **5. Explore the ICT infrastructure in the selected project sites:**

- Mobile phone coverage.
- Internet connectivity.

- Access to electricity.
- Cost of calls.
- Number of users/subscribers to mobile data.
- Maintenance.

### **6. Check the national policies and regulations on:**

- Gender.
- Agricultural development.
- Access to information.
- Information and communication technologies.
- Business environment.

### **7. Develop a business model for developing, promoting, and running the ICT platform, which may include:**

- Hardware.
- Software.
- Group training and sensitization.
- Sensitization of extension workers to respond to women's needs.
- Development of training materials.
- Software and user support.
- Evaluation.
- Financing: Public support and self-financing.

### **8. Develop a plan that ensures the continuity and sustainability of the tool/platform:**

- Ensure tool/platform is supported by an organization (private enterprise) that is committed to managing the tool over the long-term.
- Ensure the organization can provide reliable and current information.
- Ensure the organization can provide training/capacity-building.

*Source:* Authors.

# CHAPTER ONE

## INTRODUCTION

### BACKGROUND

Access to information has always been a key necessity for men and women farmers, regardless of whether they are involved in subsistence farming or large-scale agricultural enterprises. The traditional tools for receiving information on agricultural production, markets, and research results—demonstrations, farmer field days, pamphlets, hand-outs, radio, and television—have been joined by a new, constantly shifting array of information and communication technologies (ICTs) created by the booming mobile, wireless, and internet industries. These digital tools, particularly mobile (smart) phones, tablets, and computers, make information more accessible, but the tools themselves are not accessible to all. In agriculture, a digital divide persists between small-scale farmers in the developing world and their counterparts in the developed world; a similar divide remains between men and women farmers in developing countries. Although ICTs have found a foothold even on the farms of poor smallholders, many challenges limit their use, and much of their potential is unrealized—especially among poor rural women, for reasons that will become clear in this report.

Numerous studies have identified and documented how access to and control of agricultural productive assets, including access to information and social capital, can vary in relation to gender. To address men's and women's uneven access to assets, most rural development projects use “gender mainstreaming” or support “gender as a cross-cutting theme.” Yet studies of the relationships between gender and the use of ICTs in agriculture, and strategies for addressing such issues within projects, have started to appear only fairly recently. The *ICT in Agriculture E-Sourcebook: Connecting Smallholders to Knowledge, Networks and Institutions* (World Bank 2011) describes key challenges and enablers that practitioners should consider when seeking to use ICT in agriculture, with a specific focus on the gender implications (box 1.1).<sup>1</sup>

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<sup>1</sup> See Module 4 of the *E-Sourcebook*: “Extending the Benefits: Gender-equitable, ICT-enabled Agricultural Development.”

### **BOX 1.1.** STRATEGIES AND ENABLERS TO OVERCOME CHALLENGES IN THE USE OF ICT IN AGRICULTURE, ESPECIALLY IN RELATION TO GENDER

1. Conduct gender analysis to identify opportunities on how ICTs can enhance current practices.
2. Develop appropriate content to meet the needs of women and men farmers.
3. Consider using a range of ICTs.
4. Use ICTs to complement existing information channels.
5. Develop direct relationships with men and women farmers.
6. Identify employment opportunities for women with agriculture related ICT service providers.
7. Design two-way ICT programs to collect and disseminate information.
8. Develop gender-equitable national or regional policy.

*Source:* World Bank (2011a:73).

## PURPOSE OF THE FEASIBILITY STUDY

The feasibility study described here was undertaken to explore opportunities to improve the provision

of services to African women farmers and agro-entrepreneurs and their organizations by introducing ICTs adapted to their particular needs and contexts. The context for this study was six sites from two World Bank-supported agricultural projects: the Irrigation Development and Support Project (IDSP), implemented by the Ministry of Agriculture and Livestock in Zambia, and the Kenya Agricultural Productivity and Agribusiness Project (KAPAP), coordinated by the Ministry of Agriculture, Livestock, and Fisheries. Information from these sites would be useful not only for the feasibility study, but would more closely inform the Bank's lending programs and identify opportunities for leveraging and scaling up promising approaches.

The study was carried out between August 2012 and April 2014 in close collaboration with staff of the projects and implementing ministries at headquarters and in the field. Activities included a literature review, an inventory of ICT platforms and tools in agriculture, visits to the field sites, other meetings with stakeholders, the design of ICT pilots for Zambia and Kenya, and final review and dissemination workshops in both countries to present the findings.

## CHAPTER TWO

# GENDER AND ICT IN AGRICULTURE IN ZAMBIA AND KENYA

## GENDER IN AGRICULTURE IN ZAMBIA AND KENYA

Zambian and Kenyan women—like their counterparts elsewhere in Africa and the world—contribute significantly to the economy, especially through agriculture and the informal business sector. Zambia’s estimated population of 14.5 million people is largely rural (61 percent live in rural areas), fairly young, and evenly divided along gender lines (49 percent male and 51 percent female).<sup>2</sup> Because men migrate in significant numbers to urban areas in search of work and better pay, women constitute an estimated 65 percent of the rural population. Women also provide the bulk of labor in informal agriculture. A recent study finds that women provide up to 85 percent of the labor for small-scale agricultural production and almost all labor for post-harvest activities (Farnworth, Akamandisa, and Hichaambwa 2011).

Kenya, with an estimated population of 45 million (FAO 2011), has made an effort to produce gender-disaggregated data; recent statistics show that women make up 75 percent of the labor force in small-scale agriculture and own up to 40 percent of all small-scale farms in Kenya (World Bank 2007). Women have an especially strong role in producing tea, coffee, various fruits and vegetables, cereals, and poultry.

As in most developing countries, in Zambia and Kenya it is women who produce most of the food and dominate the ranks of the poor (FAO 2011). Despite recent efforts to document women’s critical role in agriculture, their participation is not often fully recognized or visible. Food crop production, where women’s participation is high, tends to be less visible than alternative agricultural pursuits because it requires less capital and labor. Even then, women tend to be regarded as “assistants on the farm” rather than

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<sup>2</sup>World Bank data.

farmers or economic agents in their own right. Such perceptions, along with cultural and social norms, make it difficult for women to graduate from subsistence farming to more commercial agricultural enterprises, which is unfortunate, because evidence has shown that women can be successful entrepreneurs running successful businesses. It is also unfortunate because economies where women participate more in the labor force and receive higher earnings tend to have less poverty and faster growth. In other words, women's economic empowerment also benefits men, children, and society as a whole (FAO 2011).

Conventional economic analyses and policies still systematically marginalize and undervalue women's contribution, while men's contribution remains the overriding (often the sole) focus of attention from government (FAO 2011). For example, women in Africa receive less than 10 percent of small farm credit and 1 percent of credit extended in the agricultural sector (FAO 2011). These observations hold true for Kenya and Zambia, where women have far fewer resources and control over those resources compared to men. For example, in Kenya a much higher percentage of men (81 percent) compared to women (19 percent) own land individually. Men's overall landholdings tend to be at least four times larger than women's, and men farm larger parcels than women (Tegemeo Institute 2011).

Women and men in both countries play different roles in the wider economy and the household. Women tend to dominate agriculture and informal micro-enterprises, while men dominate the formal and business sectors. Examining the gendered division of labor or of roles and responsibilities is critical for understanding the potential effects of an ICT intervention on the target group and the community at large. A clear understanding of how an ICT intervention may affect the gendered division of labor is also essential to mitigate any challenges that arise for women and their families as a result of the intervention.

Women's work generally occurs alongside their domestic responsibilities and childcare—which tend to make women's work less visible and less valued than men's work. Especially in rural areas, women perform most domestic chores such as collecting firewood and water. Men are expected to provide for their families, to be in charge of the household, and to make the household's

decisions. Field visits undertaken for this study document that women work continuously from one season to the next in the fields, as they are largely responsible for preparing land, sowing, weeding and otherwise tending to the crop, and eventually harvesting (and often processing) it.

Women's and men's different roles can promote unequal access to and control over productive resources, which affects how women use their time and allocate their labor in Zambia and Kenya. For instance, the 2004 Strategic Gender Assessment for Zambia (World Bank 2004) reports that women and men are active in the market economy, but the benefits of that activity are controlled by men, despite the fact that women provide the bulk of labor for industries such as smallholder agriculture. Zambian women often work 12–13 hours each day compared to men, who work 7 hours. Women's time poverty is compounded by the fact that they are the primary caregivers for their own children as well as for the sick, orphaned, and elderly. The same holds true for women in agriculture in Kenya (Tegemeo Institute 2011).

Decision-making power at the household level varies in the two countries. In Zambia, 24 percent of households are headed by women (that is, headed by widows, divorced women, or older women looking after orphaned children; World Bank 2013); the remainder are headed by men. Men in all three IDSP sites (Lusitu, Mwomboshi, and Musakashi) recognize that women work hard and take care of the household, yet women's decision-making power is still limited. In Kenya, decision-making power at the household level varies by source of income. Men mainly take decisions regarding the use of revenues from livestock sales and industrial crops. Women generally have purview over decisions related to the use of revenues from food crops, particularly millet, sorghum, and beans. Interestingly, men and women both determine how to use revenues from tea, coffee, and Irish potato production (Tegemeo Institute 2011). In most communities in Kenya, indigenous poultry farming has traditionally been women's domain; they manage the operation to provide food for the household and to earn cash for domestic needs, such as food, clothing, and children's books and school fees. Although poultry groups supported by KAPAP have a higher percentage of women members, more men have

become involved as the income from the poultry operations has increased.

## THE IDSP AND KAPAP CONTEXTS

IDSP and KAPAP are implemented nationwide, in areas with diverse ethnic, cultural, and religious differences or practices. In Zambia, the IDSP site of Musakashi is a peri-urban area governed by political structures, whereas Lusitu and Mwomboshi are governed by traditional leaders such as chiefs, who are the community leaders and set the tone for all formal relationships—business, marital (including polygamous marriages), parental—and other associations. Traditional leaders also play a major role in issues such as land allocation and are instrumental to all work with development partners. For example, in Zambia’s Southern Province, the Matantala Program (Jul-Larsen, Munachonga, and Chileche 2009) has worked closely with three chiefdoms to build schools, encourage education for children and adults, develop health centers, and share information on health issues, including HIV and AIDS. In Kenya, unlike Zambia, the farming household operates more as an individual entity, and no cultural practices have been documented to dictate farm operations. Local leaders are usually involved in mobilizing communities, however, including the Common Interest Groups (CIGs) formed under KAPAP.<sup>3</sup>

In Zambia, men in rural areas tend to have more informal exposure to business and usually have received more education than women. Studies in Mwomboshi and Lusitu prior to the start of IDSP indicate that women are rarely involved in off-farm income-generating activities. Women in Musakashi pursued some income-generating activities but still earned less from those activities than men.<sup>4</sup> In Kenya, the baseline survey for KAPAP shows that a higher proportion of women (26 percent) compared to men (14 percent) lack any formal education, but the gender gap was not substantial among those who had completed primary school (58 percent of men versus 54 percent of women); nor did a gap appear to be developing for women and men whose primary occupation was farming

and who had completed secondary and tertiary education (Tegemeo Institute 2011). At the same time, however, men’s mean income is more than three times higher than women’s. A higher percentage of men than women engage in off-farm activities, and they earn twice as much as women in those activities. More men than women have a savings account, and while both men and women successfully apply for credit, men’s credit volumes are higher than women’s (Tegemeo Institute 2011).

Women farmers participating in KAPAP and IDSP belong to groups or organizations that concentrate on a particular value chain.<sup>5</sup> In Zambia, such groups consist mainly of gardening “clubs,” with the exception of Lusitu, where a large proportion of women belong to groups involved in raising small livestock (goats and chickens). The groups are not well organized and meet on an ad hoc basis. The groups in Kenya tend to be more organized and to have a distinct purpose and structure based on the value chain in which the farmers participate. As discussed, Kenya women participate in a diverse range of value chains. KAPAP and IDSP have not created separate groups for women and men; even groups with a majority of women members include some men.

## GENDER POLICIES IN ZAMBIA AND KENYA

Both Kenya and Zambia ratified the Convention on the Elimination of all forms of Discrimination Against Women, and both countries have national gender policies. Neither has developed gender policies specifically related to agriculture or ICT, however. Gender is a cross-cutting issue, and the mandate of the Ministry of Gender<sup>6</sup> in both Kenya<sup>7</sup> and Zambia is to move gender mainstreaming forward in line ministries.

Zambia’s National Gender Policy (2000) recognizes the need for equal and full participation of women and men at all levels (Republic of Zambia, Gender in Development Division 2000), yet challenges to fulfilling this

<sup>3</sup> KAPAP gender specialist, personal communication.

<sup>4</sup> Feasibility studies of the three IDSP sites, 2010.

<sup>5</sup> See KAPAP and IDSP documents in bibliography.

<sup>6</sup> The Ministry of Gender and Child Development in Zambia.

<sup>7</sup> In the new structure, the youth, gender, devolution, planning, and national cohesion and integration initiatives have all been assembled under the Office of the President (May 19, 2014).



mandate include the lack of gender-disaggregated data as well as weak institutional mechanisms for implementing and monitoring gender policies. Other key documents outline Zambia's gender-sensitive priorities and poverty-reduction interventions, including the Sixth National Development Plan (2011–15) (which contains strategies for mainstreaming gender in sectors such as agriculture and land, mining, and infrastructure; Republic of Zambia 2011), the National Gender Policy's Strategic Plan of Action (2004–08), and Zambia's Poverty Reduction Strategy Paper. A final but major consideration is that the national Constitution contains contradictions that act as barriers to gender equality (World Bank 2004). The Constitution protects women against discrimination but permits customary law to be applied in matters of personal law, such as marriage, divorce, and inheritance. Thus in the domain of personal law, the Constitution creates power dynamics that potentially favor men and translate into gender-based inequalities.<sup>8</sup>

The Ministry of Gender and Child Development introduced the Women's Empowerment Fund in 2010. The fund was designed to increase women's human capital by working through registered women's clubs or cooperative societies. The resources provided by the ministry have financed, among other activities, training to enhance women's entrepreneurship by ensuring that they have the right knowledge and skills to run their businesses. So far, training has been conducted in Central, Eastern, Lusaka, Northern, and Southern Provinces. Some women's groups have acquired equipment such as hammer mills, treadle pumps, drip irrigation systems, and sewing machines to build their human capital and enhance their productivity (Republic of Zambia, Ministry of Gender and Child Development 2014).

In Kenya, the national Constitution explicitly commits to mainstream gender at all levels of decision making, and

Kenya's Vision 2030 puts forward the economic empowerment of women as a key component of the Vision. The Ministry of Gender facilitates implementation of the National Gender Policy and is mandated, among other tasks, to promote gender mainstreaming in national development processes and to “engender” the national budget (in other words, to incorporate funding for gender mainstreaming in the budget); review the implementation of gender-responsive policies and programs; and promote the generation of sex-disaggregated data to guide interventions (Government of Kenya, Ministry of Gender, Children, and Social Development 2011). Kenya is developing a gender policy for the agricultural sector, spearheaded by the Agricultural Sector Coordination Unit. KAPAP has provided data to support development of the policy, which has been drafted and presented to stakeholders.

## ICT POLICIES IN ZAMBIA AND KENYA

Both governments recognize the importance of ICT for development and are reviewing their outdated (2006) ICT policies. Although Zambia has no specific agricultural sector policy regarding ICT, the Zambia ICT Policy has the goal of making the agricultural sector more productive and competitive by applying ICT in planning, implementation, monitoring, and information delivery (Republic of Zambia, Ministry of Communications and Transport 2006). The policy also supports the use of ICT tools to mainstream women's issues in all economic activities through the implementation of ICT projects and programs (Republic of Zambia, Ministry of Communications and Transport 2006).

The Zambia Information and Communication Technology Authority (ZICTA) is the national ICT regulator; ZICTA issues licenses and sets minimum and maximum prices for voice communication. ZICTA is implementing its policy to promote and develop the use of ICTs in rural and underserved areas by constructing telecommunications towers there.

Within the context and framework of its Vision 2030 and Medium-Term Plan (2008–12), the Government of Kenya recognizes the importance of ICT for economic

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<sup>8</sup> See Zambia's most recent Strategic Gender Assessment (World Bank 2004). The Constitution of Zambia acknowledges the customary and statutory legal systems as primary, and Article 91 provides for two parallel court systems: the traditional courts and the judiciary. The gender issue is that the choice of system can depend on the prevailing gender relations of power in cases of personal relationships. Whereas Article 11 of the Constitution guarantees protection against gender discrimination, Article 23(4) (c) and (d) cancels out the guarantee.

development. Kenya's ICT policy presents the vision of "a prosperous ICT-driven Kenyan society," and its stated mission is "to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services" (Government of Kenya, Ministry of Information and Communication 2006). A major government initiative is to improve ICT infrastructure, bridge the digital divide, and reduce the cost of communications. A strategic framework pillar for realizing Vision 2030 is "ICT as a catalyst for economic and social

activity in the economy." This pillar includes the ICT policy in agriculture, which has been identified as a crucial sector over the plan period. The government intends to identify programs to increase the use of ICTs for management and development in agriculture. The use of ICTs, especially of e-agriculture applications that provide relevant data to farmers, will constitute a major initiative to empower farmers with decision-making opportunities that improve agricultural productivity, incomes, and national food security.





## CHAPTER THREE

# THE ZAMBIA AND KENYA PROJECTS, TARGET GROUPS, AND VALUE CHAINS

### THE IRRIGATION DEVELOPMENT AND SUPPORT PROJECT (ZAMBIA)

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The IDSP was launched in a national workshop in November 2012, with the participation of community representatives, local government officials, traditional chiefs, commercial farmers, and staff of the World Bank, IDSP team, and Ministry of Agriculture and Livestock. The Department of Agriculture in the Ministry of Agriculture and Livestock implements the project, which seeks to “increase yields per hectare and value of diverse products marketed by smallholders benefiting from investments in irrigation in selected sites served by the Project” (World Bank 2011).

The IDSP has four components. The first component provides services to support irrigated agriculture, especially training for smallholders and other beneficiaries to operate medium- to large-scale irrigation schemes on a sustainable commercial basis through partnership agreements between the government, communities, and private sector. The second component delivers public irrigation infrastructure, and the third supports private and cooperative investment in productive equipment and assets in and around irrigation schemes, including investment to stimulate the establishment of small enterprises. The fourth component is dedicated to managing and coordinating the IDSP.

The project seeks to ensure that these investments have positive impacts for women and men. It is expected to directly benefit approximately 70,000 individuals, consisting of households with direct access to irrigated land, households with members employed on irrigated land, and households that will not be involved in farming but will establish micro-enterprises. The indirect beneficiaries of IDSP include supply and value chain stakeholders, who are expected to benefit from increased supplies of agricultural commodities and better business opportunities generated by the irrigation schemes and supporting infrastructure. Consumers, particularly in urban areas, are also indirect beneficiaries; they are expected to benefit from improved supplies of agricultural

products. Gender inclusiveness is emphasized in mobilizing communities to participate in the project and in conducting the capacity-building activities.<sup>9</sup>

This study of the feasibility of using ICTs to improve women's agro-enterprises (referred to as the ICT-WE project) focuses on IDSP's Group 1 project sites (figure 3.1). The Lusitu site (Sitinkwe area) is located in Chirundu District of Southern Province<sup>10</sup> near the Zambezi River. Musakashi is in Mufulira District, Copperbelt Province, near the border with the Republic of Congo, and Mwomboshi is located in the new Chibombo District in Central Province. Surveys and other field work undertaken in these areas for the IDSP and this study have included technical, hydrological, geological, and socio-cultural studies. The results reveal important similarities and differences in the project areas, especially with respect to women's agricultural activities, entrepreneurship and use of ICTs, which will be reviewed in the sections that follow.

## FEATURES COMMON TO ALL THREE PROJECT SITES

Similarities among the three project sites were identified based on the initial literature review, subsequent field visits, and meetings with farmer groups and district government officials conducted for this feasibility study.<sup>11</sup> Across the three sites, farmers are involved in vegetable and maize production, but very few women engage in more entrepreneurial activities such as commercial maize production, fish farming, or pottery production. As discussed, the "women's" groups include men, who participate to "help the women in the group."

Several constraints make it difficult for individuals in the project sites to access information. Illiteracy is a significant constraint; literacy levels are low in general but especially low among women. The road network in all three project sites is very bad, which deters traders (and presumably providers of services such as agricultural advice) from coming to these areas, especially

during the rainy season. A few households use solar power, but virtually no electricity is available from the national grid.

With respect to ICTs, the mobile phone network has good coverage in the project areas. Mobile phone use is increasing steadily there but has not reached all households. Women's ownership of mobile phones is low, although more women own phones in Mwomboshi than in Lusitu or Musakashi. Some women have access to their husbands' or sons' phones. Men or women rarely use text messaging because many individuals are illiterate, and many do not know how to operate a phone.

The limited population that knows how to use mobile phones and send text messages encounters other challenges. For example, the Zambia National Farmers Union (ZNFU) has an ICT platform that provides information on a set of commodities to farmers via text messages (SMS). The service has countrywide coverage and is available in the project areas. Yet concluding a sale through this platform is a three-step process, which may entail high phone charges, and farmers still have to travel long distances to sell their produce. The quality of the information provided might also be an issue, as prices quoted by buyers are not always the same as those received by farmers in the end. Likewise, farmers using the National Agricultural Information Service (NAIS) (operated by the Ministry of Agriculture and Livestock) to request and receive advice via SMS pay 90 ngwee (US\$0.18) for each message, which is very high.

## FEATURES UNIQUE TO EACH IDSP SITE

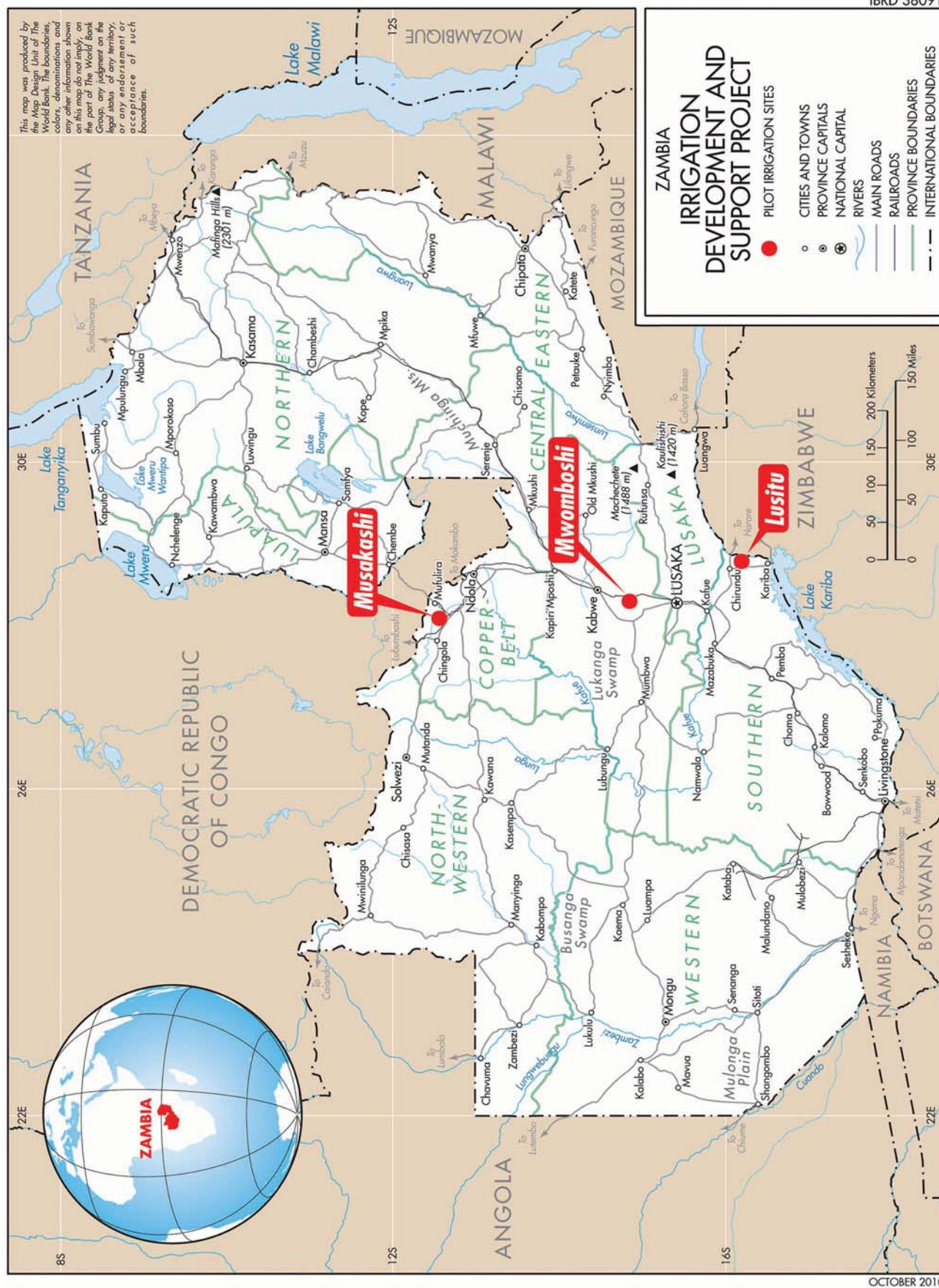
Communication channels and the level of community organization vary across the three sites. Community organization is weak in Lusitu, but a number of women's groups are active in Mwomboshi. Several women's groups operate in Musakashi, either in the form of clubs or multipurpose cooperatives established mainly to obtain government-supplied inputs such as maize seed and fertilizer. None of these groups are linked to the IDSP.

**Lusitu.** Virtually all farmers (95 percent) in Lusitu (Sitinkwe area) are subsistence farmers; only 5 percent are "emerging farmers" operating more than 4 hectares. Women engage in very few activities of greater economic

<sup>9</sup> Drawn from the World Bank Project Appraisal Document for IDSP (World Bank 2011b) and the Terms of Reference for the BNPP Grant.

<sup>10</sup> Following the 2001 elections, new province and district boundaries placed Chirundu in Lusaka Province.

<sup>11</sup> Drawn from the Interim Report (Imani Consultants 2013a) and Notes on Field Visits (Imani Consultants 2013b) for this study.



Source: World Bank (2011b:100).



value than subsistence farming; small-scale vegetable production and small livestock (goat) production are the two most significant examples.

Of the three project sites, Lusitu is also the least developed in terms of farmers' capacity to obtain information through ICTs. Television, radio, and mobile phones are the main information technologies in place, but farmers' access to all three is limited. Information on markets and prices is virtually nonexistent but also of relatively minor interest for small-scale farmers, given the low productivity of agriculture in Lusitu (box 3.1). The ZNFU text messaging service is not known to farmers.

A number of private companies, organizations, and government institutions are involved in agricultural activities in the area, including Zambia Breweries, ZNFU, the Greenbelt fertilizer company, Zambia National Commercial Bank (ZANACO Bank), and Zamseed, which are all working together under a ZNFU-coordinated project

### BOX 3.1. VIEWS FROM PARTICIPANTS AT A MEETING IN LUSITU AREA, SOUTHERN PROVINCE, ZAMBIA (FEBRUARY 2013)



#### **Female participant:**

*"Communication by phone to make arrangements with buyers is difficult: Some people who buy don't have a phone. Others who are good buyers and have phones are the truck drivers but very often they are not around. Other people who want to buy have no phone."*

**Male participant:** *"We are not so much interested in information on prices, because the amount we produce is so small that we are not really interested in obtaining price information."*

**Older female participant:** *"Is it not possible to assemble once in a while the people in a classroom to teach them how to read and write?"*

**Photo:** Women and children at Lusitu site, 2013.

**Photo credit:** Authors.

called LIMA-scheme to produce sorghum for Zambia Breweries with loans provided by the bank. A small livestock project under the Smallholder Agri-business Promotion Program (SAPP) promotes the rearing and marketing of small livestock, and consequently has a strong focus on women.

**Mwomboshi.** The population in the Mwomboshi area is involved mainly in small-scale farming, with an emphasis on producing maize and vegetables for household consumption or local sales. The irrigated areas developed under the IDSP will include some of the large-scale commercial farmers in this area.<sup>12</sup>

Farmers tend to rely mostly on radio for information on agricultural practices and prices, although they also use television and mobile phones (box 3.2). Television and

### BOX 3.2. VIEWS FROM PARTICIPANTS AT A MEETING IN MWOMBOSHI AREA, CHIBOMBO DISTRICT, ZAMBIA (FEBRUARY 2013)



**Female participant:** *"Some wives can use the phone of their husbands, but other husbands don't allow that; they say the wife will do things behind closed doors."*

**Female participant:** *"Men do things behind closed doors, but because they are men they do it, but they don't want the wife to use it."*

**Male participant:** *"All farmers are involved in selling some of the produce from farming, but we don't see it as a business."*

**Photo:** Vegetable market in Chibombo District, 2013.

**Photo credit:** Authors.

<sup>12</sup> IDSP will develop irrigation sites consisting of different types (tiers) of irrigated plots that vary by size and technology. Small-scale subsistence farmers are tier 1, and large-scale commercial farmers are tier 3.

mobile devices are used more in Mwomboshi than in Lusitu but less than in Musakashi.

A number of private companies and organizations are active in Chibombo District.<sup>13</sup> It is not clear if any are active in the IDSP. Lima Links, a mobile phone-based service being developed by International Development Enterprises (iDE) Zambia, will focus on providing information on vegetable prices and will include Mwomboshi as one of its target areas.

**Musakashi.** Most Musakashi farmers are of a relatively advanced age. They include former civil servants who are well educated, graduates of the nearby agricultural college, and individuals who previously worked on neighboring farms. Farmers produce for their own consumption or sell in small quantities (vegetables and maize, for example). Most farmers do not consider their farms to be businesses. Some farmers regard themselves as “weekend” farmers, because their primary home is located where they used to work.

Of the three sites examined here, Musakashi is the most advanced in terms of farmers’ access to ICTs. Most farmers have access to a radio, television, or mobile phone (box 3.3). The Lima Links ICT platform will soon be introduced in this area as well.

The mining industry and a few other private companies are present in the area. Mines in Mufulira District might provide a possible future market for farmers under the IDSP. The Zambia Agriculture Research Institute is located near the project site and is actively involved in the IDSP.

## KENYA AGRICULTURAL PRODUCTIVITY AND AGRIBUSINESS PROJECT

The predecessor of KAPAP, the Kenya Agricultural Productivity Project (2004–08), formed Common Working Groups (CWGs) and Common Interest Groups (CIGs) to increase agricultural productivity for selected commodities. KAPAP, implemented since 2010 by the

<sup>13</sup> Information on private companies and organizations provided by District Agriculture Coordinator Office.

### BOX 3.3. VIEWS FROM PARTICIPANTS AT A MEETING IN MUSAKASHI AREA, MUFULIRA DISTRICT, ZAMBIA (FEBRUARY 2013)



**Female participant:** “Not many people can read and write, but even if people have not gone to school, they can use the mobile phone for talking.”

**Female participant:** “We can use literate people to send and read messages on the phone, even if we cannot read and write ourselves.”

**Male participant:** “There is a lot of internet information for farmers, to learn new methods, get information on weather, rainfall.”

**Photo:** Testing the “road” during field surveys, 2013.

**Photo credit:** Authors.

Ministry of Agriculture, Livestock, and Fisheries and now in its second phase, seeks to transform the interest groups into more federated, legally recognized farmer cooperatives and improve farmers’ access to markets. A major component of the project seeks to empower farmers and a wider range of extension service providers to increase smallholders’ agricultural productivity; the ultimate goal is to transform subsistence farming into commercial agribusiness. Another major component of KAPAP focuses on agribusiness and market development. As noted in the Project Appraisal Document for KAPAP (World Bank 2009), by working through selected commodity value chains, the project assists stakeholders to plan, design, and establish sustainable agribusinesses.

KAPAP is being implemented in 20 counties that represent Kenya’s various geographical and ecological regions. The project works with 4,216 CIGs, each of

which encompasses four CWGs. All the groups include male and female farmers and are formed around a certain commodity (value chain). There are 36 value chains in total, with the number of CIGs per value chain ranging from 4 (the smallest—rice, beans, avocados) to 568 (dairy cows) and 753 (the largest—local poultry).<sup>14</sup> Under KAPAP, the CWGs and CIGs hire private providers of agricultural services (including extension advice) to support the groups' efforts to move toward more productive, commercial agricultural activities within their respective value chains. The groups all started as producer groups under the Kenya Agricultural Productivity Project, but some have progressed to joint marketing and processing activities.

KAPAP integrates gender concerns in project planning, implementation, and participation and strongly

emphasizes gender-disaggregated monitoring and evaluation. A gender-disaggregated baseline survey was conducted when the project's second phase began. The value chains that have a relatively high membership of women and cut across the various regions of Kenya are local poultry, bananas, dairy cows, potatoes, and sheep/goats; local poultry CIGs are present in 10 regions and have the highest proportion of women among their membership (table 3.1, figure 3.2, and figure 3.3). To ensure that women and men benefit equally from the project, training is provided at all levels.<sup>15</sup>

## GENERAL FINDINGS FROM THE KAPAP SITES

Because KAPAP was at a more advanced stage of implementation than IDSP, with more numerous and organized producer groups, several criteria were developed to

**TABLE 3.1. VALUE CHAINS IN KAPAP, NUMBER OF CIGs, AND THEIR MEMBERSHIP**

Value Chain	No. CIGs	No. Members	% M	% F	Value Chain	No. CIGs	No. Members	% M	% F
Rice	4	88	58	42	African birds-eye chili	63	792	46	54
Beans	4	175	55	45	Cassava	66	1,610	47	53
Avocado	4	141	48	52	Peas	69	1,879	61	39
Sunflower	6	89	58	42	Maize	69	3,799	65	35
Grain amaranth	8	94	33	67	Rabbit meat	76	1,688	49	51
Sweet potatoes	8	202	46	54	Sorghum	89	2,245	54	46
Beef	11	475	67	33	Tomatoes	116	2,801	72	28
Farm forestry	11	73	88	12	Local vegetables	122	2,770	49	51
Gums and resins	15	417	71	29	Sheep/goat meat	127	4,925	64	36
Bulb onions	16	1,172	95	5	Groundnuts	131	2,984	45	55
Black beans	16	307	38	62	Dairy goat	136	2,010	40	60
Aloe sap	20	829	24	76	Potatoes	194	5,872	51	49
Camel meat	26	715	37	53	Mango	222	5,382	71	29
Pawpaw (papaya)	29	607	67	33	Fish	314	4,850	75	25
Dairy camel	36	990	20	80	Banana	384	7,922	56	44
Passion fruit	36	521	66	34	Honey	385	6,740	78	22
Citrus	41	1,631	73	27	Dairy cow	568	18,033	61	39
Soybeans	41	952	47	53	Local poultry	753	21,145	45	55

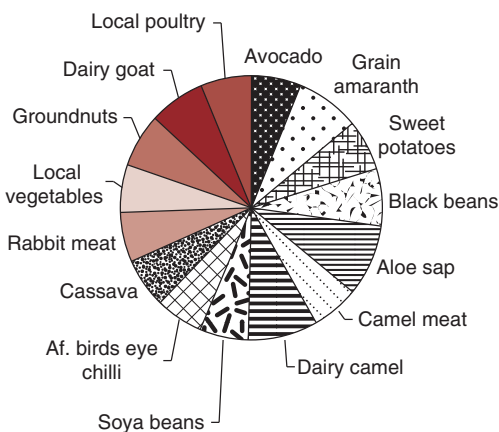
Source: KAPAP, April 2013.

Note: CIG = Common Interest Group; M = male; F = female.

<sup>14</sup> Information received from KAPAP, April 2013. The major value chains supported through KAPAP are cereals, meat, poultry, dairy, natural resources, vegetables, and fruits.

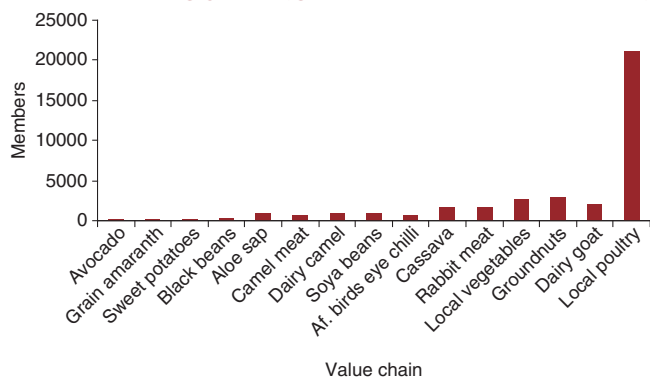
<sup>15</sup> As discussed, KAPAP also supports the development of a gender policy for the agricultural sector, which will help to create and sustain a national capacity for mainstreaming gender concerns in agriculture.

**FIGURE 3.2. VALUE CHAINS WITH FEMALE PARTICIPATION OF OVER 50 PERCENT**



Source: List of CIGs provided by KAPAP.

**FIGURE 3.3. TOTAL MEMBERSHIP IN VALUE CHAINS WITH OVER 50 PERCENT FEMALE MEMBERS**



Source: List of CIGs provided by KAPAP.

determine which value chain and project sites would serve as the basis of an ICT intervention:

1. Does the value chain have relatively high percentage of women participants?
2. Does it have a fairly short turnover period to generate income (unlike tree crops)?
3. Is there an interesting, viable platform that responds to women's needs in this value chain?
4. Are women already involved in different levels of the groups? Is this culturally accepted?

Based on those questions, the local poultry production value chain in three counties (Makueni, Kwale, and Gucha/Kisii) was selected for designing the ICT

intervention. Each location has multiple poultry farmer groups; the turnover time to generate income from poultry is relatively short; farmers' interest and participation in the value chain is high; the service providers' interest and participation in the farmer groups is high; and the farmers are open to new ideas and innovations. All three locations are relatively close to Nairobi: Makueni is about 190 kilometers (approximately 3.5 hours by road), Kwale is about 500 kilometers (about 6 hours) and Gucha/Kisii is about 320 kilometers (about 8 hours) from Nairobi (figure 3.4).

The literature review, field visits, and meetings with farmer groups, service providers, and district government officials produced similar findings for the three sites.<sup>16</sup> Membership in the poultry producer groups is mixed, sometimes consisting of nearly equal numbers of men and women. Similar challenges faced by farmers in all three counties include inconsistent prices, problems obtaining affordable inputs (especially feed), and problems with access to markets and credit. Mobile phone ownership is quite high in the three areas (about 70 percent of farmers own mobile phones, but in some groups 90–100 percent own phones). Widespread use of certain ICT tools was observed across the three project sites. All mobile phone owners use the mobile money transfer service, M-PESA, indicating the high level of financial literacy among these farmers. About 90 percent of M-PESA users knew how to make deposits and withdrawals from their accounts. Illiteracy is higher among women than men; 50–70 percent of the group members are able to read SMS.

## FINDINGS FROM INDIVIDUAL SITES

The following paragraphs review specific findings from each site with respect to the value chains, the providers of training and other support services for KAPAP farmers, the business models adopted by individual farmers and groups, and access to inputs.

**Kwale.** The local poultry value chain encompasses 24 locations and 86 CIGs. ProActive Consultant is contracted to provide training and support to farmers. Producers sell birds mainly on an individual basis, to neighbors or

<sup>16</sup> From Interim Report (Imani Consultants 2013a) and Notes on Field Visits (Imani Consultants 2013b).



IBRD 33426R2



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### BOX 3.4. VIEWS FROM KWALE (JULY 2013)

**Participant at stakeholder meeting, Kwale County, June 2013:** *“The main challenge is that there are no information systems that allow farmers and farmer organizations to analyze the price trends in the market. The prices of birds are pegged on market demand dynamics. This fluctuates, based on the market demands and volumes of birds in the market. High volumes result in lower prices and vice versa.”*

### BOX 3.5. VIEWS FROM MAKUENI (JULY 2013)

**Female participant at meeting, Nguluni Group, June 2013:** *“The key challenge is access to financial resources to buy feed. Chickens range freely now, but this exposes them to diseases from neighbors’ birds.”*

**Meeting with 2 CIGs, Makueni, September 2013:** *“All farmers sell their birds both as a group and individually. The sale should ideally be based on the age of the birds, but the farmers usually sell when the need for money arises.”*

to intermediaries who visit the area, although the more established groups sell collectively at set market days. Producers also purchase inputs on an individual basis, but they purchase vaccines collectively. Information on price trends is challenging to obtain (box 3.4).

**Makueni.** This site has 9 poultry value chain divisions, encompassing 24 locations where poultry groups are present. The poultry value chain has 2,116 members (1,969 female and 947 male). CIGs are formed in each division, and three representatives from each division form the Makueni Poultry Value Chain Board. Members of a group can be highly dispersed, making communication and collective action difficult. The Business Initiative Survival for Eradication of Poverty is contracted to facilitate capacity building for the poultry value chain. Note that many groups are still buying and selling on an individual rather than a collective basis. Access to credit remains a problem; cash-constrained producers generally must sell

### BOX 3.6. VIEWS FROM PARTICIPANTS AT A MEETING IN GUCHA COUNTY, KISII (JULY 2013)



**Male and female participants:** Income generated through poultry activities is spent on school fees.

**Men:** Use the income to invest—for example, to rent a farm, buy shop stock, buy cattle.

**Women:** Use the income to buy household items.

**Female participant on access to credit:** *“We operate a ‘Merry-Go-Round.’ This is an informal savings and loans system of ‘group-lending.’ Through this, I could access a loan to buy chicks and now I have 18 birds.”*

**Photo:** Group meeting during field survey, 2013.

**Photo credit:** Authors.

birds when they need cash rather than at the ideal time in the production cycle (box 3.5).

**Kisii (Gucha).** The poultry value chain is implemented in 24 locations, each with four zones; each zone has four CIGs. Motion Agro Consultancy provides various types of support to poultry farmer groups, such as training and demonstrations. The main challenge for the service provider is farmers’ inconsistent attendance at the sequenced training sessions. Individual producers generally sell birds to neighbors or at the market. A few CIGs with more mature business models sell collectively to the market and to a few regular customers. Men and women invest and spend earning from poultry production differently (box 3.6).



## CHAPTER FOUR

# INVENTORY OF ICT TOOLS IN AGRICULTURE IN KENYA AND ZAMBIA

## EXPANDING ICT INFRASTRUCTURE AND INITIATIVES

Investments in ICT infrastructure in the last 10 years in Zambia and Kenya dramatically increased the availability and use of ICTs, especially mobile phones. Both countries now have nationwide mobile phone networks. For example, by 2012, 86 percent of Kenya's population had mobile coverage, while only 35 had access via land lines; figures for Zambia are similar. The subscriber base in both countries is above 65 percent and growing fast.<sup>17</sup>

Expanding mobile phone networks, the growing number of mobile phone users, and wider access to the internet have lent impetus to new services provided through ICTs. In Kenya especially, ICT initiatives are booming. The M-PESA mobile banking platform is transforming access to banking and banking transactions to such an extent that other countries are seeking to replicate the business model.<sup>18</sup> The success of Kenya's ICT sector has led companies such as IBM to set up dedicated software development and research centers for the African market.

## MOBILE TELEPHONY

Mobile phones are changing the ways that Kenyans and Zambians communicate, do business, handle payments and banking transactions, and even travel. The impact on peoples' daily lives is felt among the rural as well as the urban population. Mobile phones obviate the need for costly travel to relate information; money can be transferred at little cost; banking services are available in remote areas for the first time. In agriculture, new ICT products (especially in Kenya) are providing extension services,

<sup>17</sup> Information from service providers aggregated by ZICTA and the Communication Commission of Kenya (CCK).

<sup>18</sup> In May 2012, M-PESA has over 15 million customers in Kenya (it is also used in other countries).

**TABLE 4.1. MOBILE SUBSCRIBER AND PHONE PENETRATION IN KENYA, 2003–12**

	Year									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mid 2012
No. subscribers	1,590,785	2,546,157	5,263,675	7,340,317	11,440,077	11,986,007	17,359,041	19,885,258	25,279,768	29,703,439
Mobile penetration	4.95	7.77	15.74	21.62	33.65	35.25	45	51	64.2	75.4

Source: Communication Commission of Kenya (CCK) database, 2012.

Note: Providers do not collect gender-disaggregated data on mobile phone and internet ownership and use in Zambia or Kenya.

market information, and business management tools to small-scale farmers.<sup>19</sup>

### MOBILE PHONE SERVICES IN KENYA

Over the last 10 years, Kenya's mobile phone sector in Kenya has grown by more than 60 percent each year. By April 2012, almost 30 million individuals had subscribed to mobile phone services for a penetration of about 75 percent (table 4.1). The increase in mobile penetration can be attributed to a number of factors. Telecommunications infrastructure has expanded, and mobile phones themselves have become cheaper. The value of calling cards has fallen from the lowest scratch card value of K Sh 250 in 2003 to K Sh 50 in 2008, making calling cards much more affordable.<sup>20</sup> The cost of calls has fallen as well. The average cost of a call to the same network declined from K Sh 20.18 in 2004 to K Sh 1.0 in 2012; the average cost of a call to another mobile network fell from K Sh 32.38 to K Sh 3.0 over the same period. Mobile operators now offer a certain number of free minutes for calls within their networks.

### MOBILE PHONE SERVICES IN ZAMBIA

In 2005 fewer than 10 percent of Zambia's population subscribed to a mobile phone service; the number more than doubled between 2009 and 2012 to reach 8,900,000 in October 2012 (about 68 percent of the population) (table 4.2). (Note that it is difficult to estimate the exact

<sup>19</sup> Kenya's IT industry is probably more vibrant because of a number of synergistic factors: the size of the country, the investments made in infrastructure, the success of M-PESA, levels of education, and public investments in developing IT systems for farmers.

<sup>20</sup> The exchange rate was approximately US\$1 : K Sh 86 in April 2014.

**TABLE 4.2. GROWTH IN MOBILE PHONE SUBSCRIBERS, ZAMBIA, 2003–12**

Year	No. Subscribers	No. Subscribers per 100 Inhabitants	Growth Rate (%)
2003	204,150	1.895	46.6
2004	413,120	3.725	102.4
2005	949,558	8.299	129.8
2006	1,663,051	14.369	75.1
2007	2,639,026	22.539	58.7
2008	3,539,003	26.955	21.5
2009	4,406,682	32.28	17.67
2010	5,446,991	40.14	24
2011	8,164,553	62.55	47
2012 (October)	8,900,000	—	—

Source: ZICTA (2012).

**TABLE 4.3. MOBILE SIGNAL COVERAGE (%) BY PROVINCE, ZAMBIA**

Province	Provider	
	Airtel	MTN
Lusaka	45	7.2
Central	45	3.75
Copperbelt	56	8.93
Southern	42	4.10
Western	21	2.23
North western	27	2.02
Eastern	43	2.81
Northern	40	3.04
Luapula	55	2.48

Source: ZICTA (2012).



**TABLE 4.4. INTERNET SERVICES IN KENYA, 2005–12**

Subscriptions	2005	2006	2007	2008	2009	2010	2011	2012
Total internet subscriptions	–	–	–	1,713,852	1,997,832	2,667,916	4,258,287	7,738,882
Terrestrial mobile/data subscriptions	–	–	–	1,524,948	1,981,048	2,651,651	4,189,720	7,655,576
Terrestrial/wireless data subscriptions	7,321	8,808	25,374	30,000	8,435	6,050	29,979	21,709
Estimated internet users	1,054,920	1,423,546	1,712,191	3,409,896	3,995,664	6,385,502	12,538,030	14,032,366

Source: CCK (2012).

number of people who own a mobile phone, as large numbers of people have more than one SIM card.) About 99.6 percent of customers across all networks are estimated to use pre-paid billing. As in Kenya, in Zambia mobile phone use continues to grow as the telecommunications network expands (including international fiber optic connections to the internet), 3G networks are introduced, the cost of mobile phones and calls declines, and more smart-phones are in use.

Table 4.3 shows the coverage of the two main mobile phone operators, Airtel and MTN. The mobile phone network is available in all districts, yet often service is available only in the district center and might not extend to rural areas.

## INTERNET SERVICES

In the last few years, the number of internet subscribers increased significantly in both countries, mainly because of data services provided through enhanced general packet radio service and 3G mobile phone networks. The growing number of internet users may also be attributed to innovative offerings such as connectivity to social networking sites and the use of free text message services, which are especially popular among young people. Neither country has information on how often users access the internet, what type of phones they use, or numbers of female and male users.

### INTERNET SERVICES IN KENYA

More than 90 percent of all internet access in Kenya comes through mobile phone networks. Mobile data/internet subscriptions increased by 82.7 percent in 2012 to reach 7.7 million (table 4.4).

**TABLE 4.5. NUMBER OF DATA SUBSCRIBERS, ZAMBIA, 2010–12**

	2010	2011	2012 (Oct.)
Airtel	9,881	12,123	
MTN	14,288	13,556	
Total	24,169	28,992	76,800

Source: ZICTA (2012).

### INTERNET SERVICES IN ZAMBIA

Internet access via mobile phone has grown with the introduction of 3G networks by all mobile phone operators. The latest figures (table 4.5) show a large increase in the number of subscribers, defined as users of either an internet dongle (USB modem) or BlackBerry. The number of phones used to access the internet stands at 2,600,000.

## ICT TOOLS: INVENTORY AND EVALUATION

While the uptake of mobile phones is similar in both countries, the number of ICT tools available for agriculture is not. As discussed, in Kenya the government, NGOs, and private sector have started to provide services specifically for the rural farming population. In Zambia, the number of similar initiatives is much smaller. To identify potential ICT tools that could support smallholders within the context of IDSP and KAPAP, the study team inventoried and evaluated tools available in both countries.

### ICT TOOLS FOR AGRICULTURE IN KENYA

The ICT tools, platforms, and services available in Kenya with the potential to be used by small-scale farmers and agribusinesses are listed in table 4.6. The list is not

**TABLE 4.6. INVENTORY OF MAJOR ICT TOOLS AND PROJECTS, KENYA**

Tool Name	Service/Function	Status	Quality	Coverage
<b><i>Knowledge dissemination/extension services</i></b>				
Kencall Farmer Helpline	Farmer helpline and call center, user mobile voice solution, extension advisory services, shared platform	Active–low	TBD	National
iCow	Mobile extension service for dairy cows, SMS and voice registration system, SMS info alerts	Active	High	National
<b><i>Market prices and market linkages</i></b>				
KACE	Market information through market centers, SMS, and radio	Active	TBD	Depends on the services
mFarm	Online platform for market information and linkages; registration and information alerts via internet, SMS, or mobile application	Active	TBD	National
SokoShambani SMS	SMS-based twitter solution creating closed user groups between farmers and traders for various crop value chains	Active–low	TBD	Various regions; see website
LINKS	Livestock Information Network Knowledge System provides market information through SMS and online; market analysis via the internet	Active–low	TBD	Various regions; see website
<b><i>Management information software for producer organizations</i></b>				
CoopWorks	Software for managing dairy farmer cooperatives	Active	High	National
Easyma	Information management software for dairy farmer cooperatives	Active	High	National
SYSCO	Information management software for coffee producer cooperatives	Active	TBD	National
Virtual City Agringr	Information management software for dairy and tea farmer cooperatives	Active	TBD	National
Drumnet	Software management application, SMS alerts for producer organizations	Active–low	TBD	5 provinces in Kenya
<b><i>Purchase transactions for agricultural products/services</i></b>				
Kilimo Salama	An e-Insurance, mobile micro-payment, SMS-based, proprietary software solution, shared platform, subsidized costs to farmer	Active	High	5 regions in Kenya
<b><i>Mobile network money transfer services</i></b>				
M-PESA	Safaricom's mobile money transfer service	Active	High	National
Airtel Money	Airtel's mobile money transfer service	Active	High	National
Orange Money	Orange's Telkom mobile money transfer service	Active	High	National
YuCash	Yu network mobile money transfer service	Active	High	National
<b><i>Mobile network—mobile banking services</i></b>				
Orange Money	Money transfer and banking services between Orange mobile network and Equity Bank	Active	High	National
MShuari	Savings and micro-loan product on Safaricom for M-PESA users	Active	High	National
<b><i>Banks—mobile banking services</i></b>				
Equity Bank	Equity Bank's mobile banking service	Active	High	National
Cooperative Bank	Cooperative Bank's mobile banking service	Active	High	National
Family Bank	Family Bank's mobile banking service	Active	High	National

**TABLE 4.6. INVENTORY OF MAJOR ICT TOOLS AND PROJECTS, KENYA** (*Continued*)

Tool Name	Service/Function	Status	Quality	Coverage
<b>Solar lighting solutions</b>				
D.Light	Solar lanterns	Active	High	National
Mkopa	SMS-operated solar lantern	Active	High	Planned to be national
<b>Credit management software</b>				
FrontlineSMS Credit	Online software to manage loan allocation and remittance via M-PESA	Active	TBD	National
Craft Silicon	Financial management software for savings and credit cooperatives	Active	High	National
<b>SMS communication</b>				
FrontlineSMS	Online SMS communication application	Active	High	Various partnerships in different parts of the country

Source: Study team.

Note: TBD = to be determined.

exhaustive but gives an overview of the best-known tools and applications.

The inventory identified several market information and market linkage services. Some farmers appear to have benefited from market information platforms,<sup>21</sup> but there is limited documentation that better access to price information enables farmers to increase their profits. Market price solutions that rely on mobile phone platforms face challenges stemming from the relationship between content, size of the user base, and commercial viability. Farmers will be more likely to use mobile-based services if they supply information that is unavailable elsewhere (radio, TV, newspapers), but often farm-gate prices for specific commodities are not available for any kind of media outlet to disseminate. A critical mass of traders must also be willing to share prices on a public platform and adhere to those prices. Commercial sustainability is affected when similar data are provided by other media outlets and through person-to-person interactions (for example, a single subscriber can give or sell the information to many others who do not subscribe).

Only a limited number of ICT solutions provide farm advisory services, and little data is available on their impact. The primary challenge in providing advisory ser-

vices to farmers, including poor smallholders, is to develop a commercially sustainable business model that has sufficient farmer subscribers and agricultural partners. The inventory also identified a few services that deliver insurance (via mobile phone) against drought and excessive rain to wheat and maize farmers.

Commercial management information systems (MISs) for cooperative societies are used by many cooperatives with a large member base (such as coffee, dairy, and tea cooperatives; see box 4.1 for examples). Data on the MIS software indicate that it increases cooperatives' ability to audit internal processes and increases their efficiency and profitability. At the same time, MIS software solutions face two significant challenges to widespread use. First, these applications currently require a substantial investment in hardware (computers, servers) along with the software; a second challenge, especially for smaller cooperatives, is that technical personnel with the skills to manage and run the systems are in short supply and can command high salaries.

## ICT TOOLS FOR AGRICULTURE IN ZAMBIA

The study looked at ICT tools, platforms, and services available in Zambia that had some potential use for small-scale farmers and agribusinesses. The list of ICT tools, platforms, and services is not exhaustive but provides

<sup>21</sup> Based on anecdotal information, largely from World Bank (2011a).



## BOX 4.1. EXAMPLES OF MANAGEMENT INFORMATION SYSTEMS FOR COOPERATIVES AND FARMER ORGANIZATIONS

In 2008, TechnoServe Kenya—a nongovernmental organization (NGO)—supported Amtech Ltd. to develop management information software for dairy farmer organizations. To date, the **Easyma** software is used by more than 23 cooperatives in Kenya, Uganda, and Rwanda.

Also in 2008, the Solidaridad project contracted with Deloitte Consulting Ltd. to develop an appropriate MIS for eight selected coffee cooperative societies. By the end of 2010, the **SYSCO-OP** software was used in six coffee cooperatives within the Solidaridad project. The system automates coffee bean collection up to the level of milling at local coffee cooperatives. Records from the project's development partners indicate that the system has increased efficiency and transparency at the coffee cooperatives.

The software development company Virtual City Ltd. has promoted **Virtual Agrimgr**, another MIS for producer

cooperatives. Virtual Agrimgr is being used on a wide scale with the Kenya Tea Development Authority to network production information for more than 500,000 farmers and by the Brookside Dairy Processing company to manage its network of milk suppliers.

**CoopWorks** is the first truly open-source management information system in Kenya. This license-free system, which enables cooperatives of any kind to automate their daily operations, is available for downloading free of charge from the internet. CoopWorks Dairy was extremely successful among dairy cooperatives and led to the development of CoopWorks Coffee, which has been rolled out to coffee cooperatives. More than 40 cooperative societies in Kenya use CoopWorks to manage their daily operations, and uptake of the software continues to rise.

Source: Study team.

TABLE 4.7. INVENTORY OF MAJOR ICT TOOLS AND PROJECTS, ZAMBIA

Tool Name	Service/Function	Status	Quality	Coverage
<b>Mobile banking and payment</b>				
XAPIT	Mobile banking platform of ZANACO Bank: Account balance, payments, money transfer, ATM, internet banking	Active	High	National
Airtel and MTN Money	Banking through the mobile phone operators Airtel and MTN: Account balance, payments, money transfer	Active	High	National
<b>Agriculture</b>				
ZNFU 4455	SMS-based market information service of the Zambia National Farmers Union (ZNFU), offering market prices for 16 nonperishable commodities from more than 200 companies	Active	High	National
NAIS	National Agricultural Information Service (NAIS) of the Ministry of Agriculture and Livestock offers general agricultural information via daily radio programs (each day of the week one program is broadcast in one of the seven local languages); also offers service in which farmers send questions that are answered by SMS; provides a computer with internet connection in one of the district offices	Active	Varies (Radio reaches the largest audience)	National
E-transport	Web-based transport information service of ZNFU brings users needing transport services together with transport companies	Active	Medium (needs more promotion)	National and regional
Lima Links	Mobile phone-based or Unstructured Supplementary Service Data (USSD) market information service with vegetable wholesale prices in four main markets; supports submission of prices by traders and messages between traders and farmers	Being developed	Not known	Along the line of rail

**TABLE 4.7.** INVENTORY OF MAJOR ICT TOOLS AND PROJECTS, ZAMBIA (*Continued*)

Tool Name	Service/Function	Status	Quality	Coverage
E-extension	USSD extension information service of ZNFU provides market information and general agricultural information (price information, events information, production information) and serves as a communication tool and trading platform	Active	Not known	National
<b>Weather</b>				
RANET	Climate information service of the Zambia Meteorological Department: weather reports available on the website; also promotes solar/windup radios and community radio	Active	Varies	National
<b>Education</b>				
I-school	Education platform that provides interactive lessons based on the Zambian national curriculum on a tablet; designed for students to go through the lessons individually	Active	High	National
<b>Connectivity</b>				
LinkNet	Infrastructure in Macha mission station to access the internet through a Very Small Aperture Terminal (VSAT) link and computers	Active	Not known	Macha mission
Africonnect	Internet access infrastructure in and around the rural district of Namwala: Internet café, training of local staff, internet service to major government institutions, local schools, and district hospital	Active	Not known	Namwala

Source: Study team.

an overview of the best-known tools and applications (table 4.7). No tools identified during the inventory were designed specifically for women in agriculture.

The inventory reveals that only a few tools are delivering information relevant to Zambia's agricultural sector. ZNFU's market information service has been running for six years and delivers market information using text messaging, although the information is limited to non-perishable crops and products (box 4.2). NAIS and the meteorological department use more traditional communication technologies, of which radio has the largest audience. Two services under development appear to be potentially useful and cost-effective for delivering information for small-scale farmers and traders. The E-extension service from ZNFU aims to provide general extension information. Lima Links by iDE aims to provide market information for vegetable growers, filling an important niche left unoccupied by other services (box 4.3).

The I-school project has developed an interactive learning platform of high quality that exposes young people to

the world of ICT. It has no direct relevance for improving women's farms or other businesses, although presumably mastery of the subject matter would add to girls' and women's business skills.

## MAIN FINDINGS FROM THE ICT INVENTORIES IN KENYA AND ZAMBIA

Several findings emerge from the ICT inventories. Perhaps most important from the perspective of this study is that none of the tools were developed specifically to address the needs of women in agriculture. Tools for small-scale farmers have been developed, implemented, and piloted in both countries, although comparatively fewer tools have been developed in Zambia.

Published data for assessing the ICT tools implemented in these countries are extremely scarce. Very little information exists on these technologies with respect to their quality, evaluations and impact of their performance, and lessons learned from using them. Information on the

## BOX 4.2. ZNFU 4455 PROVIDES FARMERS WITH PURCHASE PRICES AND CONTACT DETAILS FOR COMMERCIAL BUYERS

ZNFU's market information system is based on a text messaging "pull" model—in other words, users receive information upon request—and thus is based on users' needs. The system has three groups of users: farmers, small-scale traders, and large-scale traders. The service provides information on purchase prices offered by more than 200 companies in Zambia for a set of 16 commodities and products, along with the companies' contact information. The service is simple. The user texts the first four letters of the commodity to the number 4455 in the Airtel network and receives a list of purchase prices (the highest is displayed first) from the companies currently purchasing that commodity. To receive the contact details of a company, the user sends the name of the company to 4455. More than 15 percent of text messages are estimated to lead directly to sales of produce.

A survey to understand farmers' use of the system and attitudes toward the service found that: 40 percent said they could negotiate better prices; 50 percent claimed to have increased incomes; 21 percent now bulk their products before they sell; 52 percent now sell to different buyers; 23 percent say they have built new trading relationships; and more than 30 percent report increased confidence to grow cash crops or rear animals. Small-scale traders use the system to find markets for the commodities they trade, find prices at which they can sell their products, and learn which commodities provide the highest margins. Large-scale traders use the system for procuring produce and discovering prices offered by their competitors.

*Source:* ZNFU presentation, final workshop for this study, Zambia, April 2014.

## BOX 4.3. LIMA LINKS—A MOBILE PHONE-BASED SERVICE LINKING VEGETABLE PRODUCERS AND TRADERS IN FOUR MARKETS IN ZAMBIA

About 15,000 Zambian farmers are working with iDE to improve their vegetable production. As part of that effort, iDE is developing a USSD platform for market and price information that can run on any mobile phone. The platform, which links farmers with traders, enables them to view current prices submitted by traders and to send and receive messages on offers and requests for produce. Although Lima Links is still under development, some initial observations indicate the potential effectiveness of the approach taken by the developers:

- Traders are now willing to share prices on the service, because sharing that information helps them to negotiate prices with farmers, who are now able to see the prices on offer.
- Traders and farmers renegotiated the fee structure for charging traders to sell produce. Under the new arrangement, the fee is 10 percent of the value of the sale rather than a randomly determined fee.

- Traders are responsible for paying the individuals who off-load the goods when they arrive at the market, because they have more expertise in negotiating those prices.

Despite the good faith of many participants, feedback from traders and farmers highlights challenges that can arise in the buying and selling process. Traders claim that farmers do not always respond to their requests to deliver goods when they need them but deliver the goods to other markets. Farmers claim that traders send requests for deliveries indicating a shortage in the market and therefore high prices, but when farmers deliver the produce, prices are low.

*Source:* iDE presentation at the final workshop for this study, Zambia, April 2014.

funding models used to develop and run the tools or on their potential sustainability is equally difficult to unearth.

The financial tools developed for the mass market have enjoyed wide commercial success and use, but no information is available on the extent to which small-scale farmers use them. Very few commercial ICT products appear to

target small-scale farming. Most tools for this segment of the population are funded through projects and donors. Even tools that have a business model still rely (directly or indirectly) on donor funding, and they are not expected to run after a project ends. For that reason, sustainability of ICT tools is a major issue. The commercially viable tools for financial services are an exception, along with ICT

tools run by strong organizations that have integrated the tools into their activities, are committed to their successful use, and have the (financial) capacity to run the tools in the absence of external funding. ZNFU 4455 exemplifies these qualities. One promising set of ICT tools is the MIS software developed for cooperatives focusing on different commodities in Kenya. They reach a large farmer base and seem commercially viable and successful. Their applicability or adaptability for smaller producer groups should be verified. No such tool for larger farmer groups or cooperatives is marketed in Zambia.

## CHALLENGES IN RURAL COMMUNITIES' USE OF ICTs

The use of ICTs in rural areas, especially increased mobile phone connectivity and lower phone prices, has almost certainly had an enormous impact on the rural economy and communities in developing countries. Yet challenges remain. Mobile phones must be charged, and electricity is often unavailable in rural areas. The cost of using the phones is relatively high, and mobile network coverage can be poor in rural areas, especially if they are remote.

Rural internet users face their own set of challenges. Where there is voice calling coverage there is also GPRS service, which supports 3G services and internet connectivity, but service can be poor and intermittent. Mobile phone operators are reluctant to introduce 3G networks in rural areas without incentives, however, because the pool of customers who can pay for the service is insufficient. In any event, few users have access to internet-enabled

phones or computers with a dongle, and many have low or no literacy (or ICT literacy). Nonusers may lack any understanding of the benefits of the internet, especially if little content has been developed to meet local information needs. Internet service providers (ISPs) can provide broadband internet to rural communities, but like their counterparts in the mobile phone business, ISP companies are not willing to invest in rural areas because of the small customer base, preferring to set up their networks in the larger provincial towns. Aside from the constraints already mentioned, additional issues related to introducing broadband internet connectivity in rural areas and small provincial towns include the following:

- » Equipment (VSAT, servers, routers, and so on) is costly to acquire and subject to damage from intermittent power outages.
- » Networks are expensive to maintain and operate (bandwidth, backhaul, and transmission), and it can be a challenge to find capable local staff to operate the services.
- » Because companies pay the same rates and taxes in rural and urban areas, they are less interested in investing in rural areas.
- » Demand from the government and government employees, which could have created a critical mass, is lacking, as there is no e-government.

With these considerations in mind, the next chapter identifies which ICTs could be piloted in Zambia and Kenya with the specific goal of improving women's agro-enterprises and entrepreneurship.



## CHAPTER FIVE

# PILOT DESIGN AND IMPLEMENTATION IN ZAMBIA

### OVERVIEW

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The concept for the pilot was based on an understanding of the context and the features required in an easily scalable ICT solution that meets the range of information and networking needs involved in linking stakeholders—particularly women farmers and entrepreneurs—to vegetable value chains. Farmers in the three sites mainly require information on irrigated crop production and marketing, but the inventory found no readily available ICT initiatives or tools capable of providing such information. Two platforms could potentially be adapted for IDSP farmers, however. Lima Links operates with vegetable farmers in two of the three pilot sites, Musakashi and Mwomboshi, and ZNFU 4455 provides market and price information nationwide for 16 commodities—although not vegetables—and is mainly used by farmers on a seasonal basis when they sell their crops.

### PILOT CONCEPT

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Demand for extension information is high, especially among women, whose access to information has always been limited. As IDSP introduces new irrigation schemes, farmers will require more information on irrigated agriculture and opportunities for related agro-enterprises in the project sites. For that reason, the concept for the pilot is to *facilitate the creation of a network of information exchange among stakeholders, in which groups of women farmers and entrepreneurs are the central source of demand for the information being shared*. The network will be developed by linking female farmers with one or more providers of extension information for selected irrigated agriculture value chains of interest to women. In this case, information from the IDSP indicates that the vegetable value chain involves numerous female farmers and has the most potential for growth, so the pilot will focus on that value chain.



## COMPONENTS OF THE PILOT

The pilot will have three components: providing extension information, providing group management information and business training, and providing an interactive communication channel. Priority will be given to the first two elements.

**Providing extension information.** Site liaison officers and agricultural extension officers can use ICT tools to reach farmers in the most remote locations. Even though extension officers have been provided with motor-bikes, with ICT they can provide information in an even more timely way without having to travel to the farm. Farmers who previously had little or no contact with extension officers will now be able to receive crop management information. The current ratio of extension officers to farmers is approximately 1:1,000. If ICT enables an extension officer to send information to selected lead farmers or groups instead of having to deliver that information in person, the extension officer is more likely to meet the needs of all of the clients in the area. Extension will reach even more individuals if a *Training of Trainers* model is applied. Another expectation is that enhanced access to information will improve the professional skills and confidence of extension officers in remote areas, who generally have very limited opportunities to update their knowledge.

**Providing group management information and business model training.** As groups in the project sites are fairly new or lack a strong organizational structure, it is important for them to learn about group management and business models, as well as long-term business planning. A functioning, economically viable business model is a prerequisite for a group to receive and use market information to link successfully to markets.

**Providing an interactive communication channel.** In addition to receiving information from extension officers, farmers should be able to request information from them as and when needed and send information to back to them as need (for example, information on pest outbreaks). For that reason, the ICT tool should enable interactive communication among farmers, service providers, and IDSP staff. In practice, given the limited number of extension officers and service providers in the

project area, this feature will be developed gradually as familiarity with the tools and the stakeholders grows.

## THE CANDIDATE ICT TOOLS FOR THE PILOT

The first option considered for the pilot was to ***distribute mobile phones to women farmers or women's groups***. The rationale was that most women have access to phones only through their husbands, other male family members, or friends and neighbors, but if women own phones they can use them to improve their businesses through calling, text messaging, and other applications. There are no indications, however, that the distribution of phones by itself will improve the businesses of women in the three sites (particularly in Lusitu, where the development of enterprises led by women is very low). A phone would not necessarily help a woman to sell her vegetables to her customers, because presently such interactions happen at the farm gate with traders. At current prices, the cost of one call to a customer could potentially equal the entire value of the sale to that customer. Finally, as noted, none of the available ICT platforms or applications can provide more comprehensive information and networking to support women's vegetable enterprises.

A second option was to ***provide women's groups with tablets and an internet connection***. A number of context-specific factors indicated that tablets were the appropriate ICT tool to pilot at the three project sites:

- » ***Information needs.*** Women farmers at the project sites are involved mainly in maize production in the three project sites, but they also participate in the vegetable value chain on a small scale. Given the anticipated increase in vegetable production on irrigated land under IDSP, it is important that women obtain technical information on vegetable production and on quality issues pertinent for marketing their produce.
- » ***Literacy level.*** Low literacy levels can be overcome by using certain features of tablets, such as icons, voice recordings, and videos, and information can be shared and stored easily in tablets.
- » ***Mobile phone ownership.*** Women in the three sites generally do not use mobile phones; if they do use them, they do not use them for business. While

the use of basic phones would reduce the pilot's startup cost, future use could be quite expensive, based on the present cost of text messaging.

- » **Internet connectivity.** Even though the groups will need to pay for internet connection, the project could support that cost at first; gradually, the groups could use the income generated from increased vegetable production to pay for the connection. The costs of connecting to the internet are relative low (approximately US\$21 per month).
- » **Access to electricity.** All project sites will have access to electricity by the time the IDSP is complete, but not at the start. Groups will be provided with solar panels and chargers, which can also be used to charge other devices such as mobile phones and generate revenue to cover the groups' costs.
- » **Tablet use and maintenance.** Tablets will be cared for by each group under clearly defined responsibilities for the leader and designated the group members. A training package will be designed for women's groups as well as other recipients of devices, covering the use and maintenance of tablets and solar chargers. Lead women farmers will be trained to use tablets in close collaboration with Sofreco, which is the community participation and capacity building service provider for IDSP. The content of the agricultural extension training will be developed by the Ministry of Agriculture and Livestock and the Agriculture Research Centres, while the content of the agribusiness training will be developed by the IDSP staff working on agribusiness.

The extension information on irrigated vegetable production supplied through the tablets could consist of recordings (voice with text, pictures, and/or video) uploaded through a temporary internet connection, interactive videos (which require an intermittent internet connection), or audio conference calls (which require an internet connection for their duration). Similarly, management and business model information and training could be obtained through the tablets. Aside from audio calls and video, the tablets can facilitate communication by e-mail (which requires an internet connection for receiving and sending but not writing or reading). Given that certain

areas have unreliable internet connections, an advantage of tablets is their “offline capacity”—in other words, most of the time mobile devices can display, collect, and store data and information, and once an internet or telecommunications network becomes available, the tablet will connect to send or receive new information. Even though tablets are relatively expensive,<sup>22</sup> prices are falling rapidly, and their potential as a platform for group communication seems strong.

## THE PROPOSED APPROACH FOR IMPLEMENTING THE PILOT

The pilot will target five producer groups with a majority of female members<sup>23</sup> selected from each of the three IDSP sites. The implementation will be completed in phases, starting with sites and groups that are ready to practice irrigated agriculture. Other sites will join in as they establish their settlements, facilities, and activities. Groups will be selected in a participatory way with the communities involved, based on a number of criteria that should help to ensure that the groups are able to use the tool (box 5.1).

### BOX 5.1. READINESS CRITERIA FOR SELECTING WOMEN'S GROUPS TO PILOT THE USE OF ICT TOOLS

- The resettlement process should be underway.
- At least some women in the group must be literate.
- The group should be active and meet on a regular basis.
- Group members must devise an arrangement to compensate the person(s) handling the device(s) for their time and maintenance efforts.
- The women in the group must be involved in a vegetable value chain that at least partly includes commercial activity or involves private sector actors (for example, processors) in the area.

Source: Study team.

<sup>22</sup> Tablets in Zambia cost around US\$600 in 2013, whereas smartphones (generally BlackBerry) started at US\$150 for the simplest models.

<sup>23</sup> As the field surveys indicated, the reality is that all women's groups count at least a few men among their members.

## PROVIDING HARDWARE

The budget for the pilot will include the provision of hardware. Devices (tablets) and solar chargers will be provided to the selected groups in each project site. Tablets will also be provided to the IDSP site committees at each of the three sites, to the block or camp extension officers from the Ministry of Agriculture and Livestock, and to the IDSP site liaison officers.

## PROVIDING TRAINING

Recipients of the devices will be trained to use and maintain the tablets and solar chargers. Sofreco will be heavily involved in the design and delivery of training to farmers. Sofreco will also provide training to extension officers in terms of responding to women farmers' information needs. As noted, the Ministry of Agriculture and Livestock and the Agriculture Research Centres will develop content for training in agricultural extension, whereas IDSP staff specializing in agribusiness will develop the agribusiness training content. The implementer will also regularly follow up with the service providers. The use of devices will be monitored by the implementer as well as by the relevant staff of the IDSP and Ministry of Agriculture and Livestock. The *Training of Trainers* methodology will be used at the three sites to reach out to as many farmers as possible and enhance

the effectiveness of the extension officers. Lead farmers with reading and writing abilities will be chosen as the trainers responsible for disseminating information more widely among the farmers.

## LINKING WOMEN FARMERS AND THE PRIVATE SECTOR

The ICT devices and training are the means to improve networking and access to relevant information among women farmers and entrepreneurs. For the improved networking and access to information to pay off, however, the key is to identify a pool of buyers and processors for the vegetables and to link the women's groups to them. For that purpose, the pilot will develop a roster of potential private companies and other relevant stakeholders, and also build their awareness of the women's groups as suppliers to the private sector.

## MONITORING AND EVALUATION

The pilot will be monitored based on a two-pronged approach. It will monitor and evaluate actual use of the tablets and the communication network (uptake of the tool). It will also monitor and evaluate the actual results and outcomes achieved by using the tablets and communication network (gauging whether uptake of the tool had positive social and economic results).

## CHAPTER SIX

# PILOT DESIGN AND IMPLEMENTATION IN KENYA

### OVERVIEW

As in Zambia, the pilot will introduce ICT tools and platforms to women (and youth) in the KAPAP sites to understand whether their use can enhance women's agro-enterprises. Although no suitable tools and platforms are already in use, the needs of the target communities are better articulated, and the organization and business models of their farmer groups are more advanced, than those of their counterparts in Zambia. The concept for the pilot was developed based on an understanding of the needs and capacities of the target communities and the features they require in an easily scalable ICT solution, as indicated by the ICT inventory, research with the farmers' groups, interviews with the KAPAP teams working at the project sites, and the potential for the pilot to link with KAPAP's objectives for the development of the poultry industry.

### PILOT CONCEPT

The feasibility study revealed that a tool enhancing the organization and business model of groups in the poultry value chain would best respond to the needs and capacities within the target communities. Information from KAPAP indicates that poultry value chains are popular in the KAPAP areas, have high participation of female farmers, and have a short turnover time. In addition, the poultry groups operate on solid basis with profitable business models. For that reason, the concept for the pilot is to *use ICT tools for supporting individual poultry farmers and their organizations to develop and implement efficient systems and processes for managing their organizations, production, sales, finance, and communication.*<sup>24</sup>

### COMPONENTS OF THE PILOT

The pilot has three main components: deploying an ICT tool to support farmer organizations in running organizational and financial management systems; deploying an

<sup>24</sup> Appendix E: Pilot Concept Kenya

ICT tool enabling individual farmers to access productivity and financial management data; and enhancing communication among the stakeholders in the value chain.

**Deploying an ICT tool to support farmers' organizations in running organizational and financial management systems.** A basic record-keeping ICT tool will enable farmers' organizations to capture, store, disseminate, manage, and monitor data on productivity. The same tool will make it possible to keep financial records for individual farmers and for the organization as a business unit.

**Deploying an ICT tool enabling individual farmers to access productivity and financial management data.** The tool will enable individual farmers to track their poultry production and their sales through their producer organization. At the same time, capacity-building activities will enable farmers to understand the profitability of their business venture, including basic concepts such as profit/loss, savings, and financial literacy.

**Enhancing communication among the stakeholders in the value chain, including communication between the management committees of farmers' groups, the KAPAP County Unit, the service providers, and individual farmers belonging to groups.** ICT tools will be used to provide efficient, cost-saving solutions for communicating information on farmer events, disease outbreaks, market demands, and prices.

## THE CANDIDATE ICT TOOLS FOR THE PILOT

### **Poultry Producer Group Management Software.**

The Poultry Producer Group Management Software, developed for TechnoServe Kenya but not yet piloted, could respond to the requirements described previously. This software package enables poultry producer groups to collect data on their business, create reports, and do the accounting for their business activities. The software has the following functionalities:

- » Electronically captures farmer membership data records at various levels, such as data for a farmer as a member, a shareholder, and a supplier.

- » Electronically captures sales of chickens by registered farmers.
- » Tracks product rejects.
- » Electronically generates a supplier receipt for each farmer.
- » Electronically captures the purchase of chickens by registered buyers/traders.
- » Electronically provides financial account statements for registered suppliers.
- » Assigns a credit facility to registered suppliers.
- » Generates suppliers' payrolls and transfers/credits the various payment accounts registered by the farmers.
- » Generates various account reports for all business transactions of the poultry producer groups.
- » Through an SMS module, provides an affordable information messaging platform between farmers and all other stakeholders in the poultry producer groups.
- » Consolidates data from all poultry producer groups to give a complete overview of all purchases of chickens from farmers and poultry producer groups at any time.

**CoopWorks.** CoopWorks is a financial and member management information system for farmers' associations and agriculture cooperatives that was developed for the dairy value chain and later adapted for the coffee value chain. More than 40 cooperative societies in Kenya use CoopWorks in their daily operations, and its use continues to expand. The tool is currently being adapted for the maize value chain and could potentially be adapted for this pilot with the poultry value chain. The tool, which automates all of a cooperative's activities at an affordable cost, has modules for managing members, inventory, payroll, shares, cash and bank accounts, and debtors and creditors, among others. By tracking all of the information vital to a cooperative's operations, the software improves accountability and efficiency, reduces operating costs, increases productivity, and promotes fast, timely, and informed decision making. By placing cooperatives on an increasingly sound operational footing, the software can increase farmers' confidence in agriculture as a business and contribute to the reduction of poverty in rural areas.

## THE PROPOSED APPROACH FOR IMPLEMENTING THE PILOT

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The pilot will initially target three CIGs in Makueni County, with the possibility of scaling up to include more CIGs and more counties in the areas where KAPAP is implemented. Makueni was chosen as the initial target site because it is close to Nairobi and has a large number of active poultry CIGs. Because the site selected for the pilot is near the capital, it may offer certain advantages to producers, such as better infrastructure and access to markets; on the other hand, the larger number of poultry CIGs in the pilot area, and their large membership, may increase competition among poultry producers and lower the prices they receive. These factors will have to be closely followed and taken into consideration when the impact of the pilot and possibilities for scaling up and scaling out are evaluated.

The CIGs selected to participate in the pilot will be done jointly with KAPAP and service providers in the area, based on the following criteria: Women's participation in the mixed groups is relatively high; all group members participate actively in the poultry value chain; a few members are computer literate and available to be trained as data clerks (including women); the group has a central place that can serve as an office, where a computer could be installed; and the group has access to electricity.

### PROVIDING HARDWARE AND SOFTWARE

The pilot project will provide hardware (computers, modems, printers, and UPS) and software (for poultry management) to the three selected CIGs.

### TRAINING

An implementation phase of 18 months is foreseen, during which the CIGs will be trained to use the poultry software, closely monitored by the software developers, KAPAP, and service providers in the county. Aside from covering the management and running of the software, the training will enable CIG members to understand the information generated by the system, including the financial implications of the business for the groups and for their individual members. As mentioned, specific training will be provided to a data entry clerk and selected members from each CIG to run and maintain the system.

### MONITORING AND EVALUATION

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Because poultry production cycles are relatively short, the poultry producer groups and individual farmers will be able to gain experience in using the poultry management software and attain tangible results in their enterprises over the course of the pilot. The results will be evaluated in close collaboration with the service provider. Because the service provider (Technoserve) is supporting efforts by other poultry groups to pilot the same software in parallel with the pilot effort described here, results from both pilots could be compared for greater insight into the factors that contribute to success.

The poultry software will be implemented in four phases, which form the basis of the workplan for the pilot: a planning and preparation phase; initial implementation and training; ongoing support and monitoring; and an evaluation phase. Appendix E presents the detailed workplan for implementing the Kenya pilot.





## CHAPTER SEVEN

# CONCLUSIONS

Information is vital for improving agricultural productivity and generating better incomes, yet women often find it challenging to obtain such information. Although it is commonly acknowledged that the extensive use of ICTs in agriculture has improved the dissemination of information and communication in developing countries, not everyone has access to ICTs and their benefits. For reasons discussed previously, including illiteracy, poverty, and unequal decision-making power in the household, women in the agricultural sector (farmers and entrepreneurs) are often at a particular disadvantage when it comes to accessing and learning to use these powerful technologies.

The literature review undertaken for this feasibility study, along with the many field visits and consultations with government officials, development partners, private sector, and NGOs, have all provided helpful information for identifying and understanding the main challenges involved in designing and implementing projects using ICTs for rural women's economic empowerment. In brief, no ICT tools have been developed exclusively for women farmers in either Zambia or Kenya, and no data are available on the impact of existing ICT tools used by rural women. Few commercial ICT products target small-scale farming. Kenya has a larger number of ICT tools available for small-scale farmers compared to Zambia, where the number is extremely low, but most of these tools have been funded by donors, and their viability is uncertain when donor support comes to an end. At the same time, women farmers and entrepreneurs in Zambia and Kenya emphatically indicate that they need reliable, timely access to technical and market information. They fully recognize the advantages of joining and interacting with other stakeholders in the value chain, because participation will enable them to obtain knowledge of current requirements on quality and product safety, gain bargaining power with buyers, and build a relationship with the private sector as a reliable supplier.

Concepts for two pilots of ICTs among women farmers in Zambia and Kenya were proposed. In Zambia, where very little entrepreneurship is seen among rural women at present, but where the development of irrigation under IDSP offers considerable potential for women to expand into more commercial (and profitable) vegetable

production and marketing, the pilot aims to use ICTs to enable female farmers' access to extension information and link them to service providers as well as business model trainers. In Kenya, where KAPAP is already working with poultry producer groups (which have large numbers of women members), the pilot aims to use ICTs to support individual poultry farmers and poultry producer organizations to develop and implement more efficient systems and processes to manage their organizations, production, sales, finance, and communication.

Even though ICTs alone cannot alleviate gender inequalities in agriculture, they can act as a vehicle of social transformation by lifting some of the constraints faced by rural women, including a lack of information, skills, and contacts to move their agro-enterprises forward. The information developed through this feasibility study provides food for thought with respect to the next steps in implementing the pilots, the implications of the findings for IDSP and KAPAP, and the design of similar ICT interventions for women in the future.

## CHAPTER EIGHT

# LESSONS LEARNED

### DIFFERENT CONTEXTS, DIFFERENT CONCEPTS

This study developed two concepts for pilot efforts to learn whether ICT tools can enable women farmers and entrepreneurs to move from producing almost entirely for subsistence to producing for a wider commercial market. The research and the iterative process of designing the pilots confirm that there is no single blueprint for designing a pilot to achieve this goal. Context matters. The concepts for the pilots differ in significant ways because of contextual differences in Zambia and Kenya, especially differences in the availability of tested and successful ICT tools, in the target populations in the project areas (women in particular, but not excluding men), and in the needs of women (and men) in relation to specific value chains.

Different categories of female (and male) farmers will differ in their access to and use of ICT tools, owing to a range of factors. These differences matter. Two specific myths that reduce the potential for ICT applications and other interventions to contribute to gender-equitable agricultural development are worth emphasizing here.<sup>25</sup> First, small-holder farmers are often considered an undifferentiated group of beneficiaries, with the same needs and same opportunities—but they are not. Second, men and women are assumed to have the same ability to access, use, and control ICTs—in other words, ICTs are assumed to be gender neutral—but they are not.

The remainder of this chapter summarizes the specific lessons learned in developing the pilots. For additional guidance in overcoming the challenges related to gender and ICTs in agriculture, see the *ICT in Agriculture* e-Sourcebook (World Bank 2011a).

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<sup>25</sup> See World Bank (2011a:73), Module 4 (“Extending the Benefits: Gender-equitable, ICT-enabled Agricultural Development,” section on key challenges and enablers).

# MAINSTREAMING GENDER AND TAKING AN EQUITY APPROACH

Both IDSP and KAPAP aim to mainstream gender and apply what they call an equity approach (see box 8.1 for a definition of equity and figure 8.1 for an illustration). For KAPAP, implementing an equity approach means, among other things, that the project collects as much gender-disaggregated data as possible and that “services should be provided to all farmers; men, women, youth, disabled, marginalized and no preference is given to one gender.” For IDSP, it means that various gender studies have been

## BOX 8.1. EQUITY AND ACTIONS TO PROMOTE EQUITY

Equity is defined as the quality of being fair, unbiased, and just. In other words, equity involves ensuring that everyone has access to the resources, opportunities, power, and responsibility they need to reach their full, healthy potential as well as making changes so that unfair differences may be understood and addressed.

Source: “Rising to the Challenge,” Sex and Gender Based Analysis e-Learning Resource ([www.sgba-resource.ca](http://www.sgba-resource.ca)).

**FIGURE 8.1.** DIFFERENTIATE EXTENSION/ INFORMATION PROVISION



Source: Authors.

executed<sup>26</sup> and that “the project gives equal treatment to all inhabitants of the catchment areas.” At workshops held in both countries for this study, participants maintained that women and men have the same needs when accessing information.

The projects aim to “be fair, just, and un-biased” in their approach. The pilot designs described here acknowledge that smallholder farmers are a differentiated group—in Zambia, for example, poorer subsistence farmers differ from emerging farmers, and in Kenya as well as Zambia, female smallholders differ from male smallholders. Because access to and control over resources varies by gender, gender is an important part of the “equity approach.” This recognition guides projects and other practitioners in developing approaches that may differentiate the way, for instance, information is presented or activities are chosen to be promoted. One option might be to form groups specifically for women, especially at the initial test/pilot phase. When projects work with specially established women’s groups, however, male farmers, husbands, sons, and leaders should be aware of the groups’ purpose and kept abreast of developments. Where necessary or applicable—as in Kenya, where all groups supported by KAPAP are mixed—working in mixed groups might be a better option, taking into account the different opportunities and challenges women and men face, even if they are members of the same group.

## REACHING THE POOR AND DISADVANTAGED

Many interventions involving the use of ICTs with rural (female) farmers are based on the notion that these farmers are already part of a value chain, producing for a (local) market and obtaining an income from their agricultural activities. For individuals who are mainly subsistence farmers, who sell produce locally to neighbors or traders only when they have a surplus or need cash (for an emergency or to cover significant household expenses such as school fees), the advantages of using ICTs to market their production are not part of their reality.

<sup>26</sup> Including “Gender and Social Mainstreaming Training” (financed by the World Bank–managed Trust Fund for Environmental and Social Development) and “Women Land Rights” (financed by the Nordic Trust Fund).

In general, to acquire, use, and take advantage of commercial ICTs, a farmer either needs some capital, a regular income, or access to a project or program that funds or partially subsidizes the initial acquisition and use of the tools and software. Even then, after the support has ended, the running cost might be too expensive for (female) farmers, if their farm activities have not yet been transformed into successful (small) businesses. There is a risk that the introduction and use of ICTs might therefore maintain or increase the gap between the poorer (often female) farmers and those who are already better off.

In designing ICTs and putting them to work, choices have to be made. These choices will be made after considering sustainability, cost-effectiveness, and policy. A choice guided by the cost-effectiveness and sustainability of a particular tool or platform might prevent poorer and more disadvantaged groups from benefiting from it directly. However, it is largely the kind of information disseminated, the means of disseminating it, and the information provider that determines whether more disadvantaged people have access to and can benefit from the information provided. For example, market information provided for a fee through a text messaging service to a personal smartphone is an example of an ICT that is clearly beyond the reach of the poorest, whereas participatory extension videos shown by government workers have successfully reached and benefitted poor women in India.<sup>27</sup> In addition to adopting the right technology and the right information, changes in policy—for example, subsidies or reduced tariffs—can also make ICTs more accessible to the disadvantaged.

## TAKING THE ANALYSIS BEYOND DIFFERENCES BETWEEN MALE AND FEMALE FARMERS

The challenge, as noted, is that farmers are often considered an undifferentiated group of beneficiaries. Gender analyses have been promoted as a means to acquire specific information on access to and control over assets, specific needs, and challenges among women and men

in a project target group or in communities within a target area. Yet for the purposes of the ICT pilots outlined here, and for other ICT interventions in general, it is not enough to differentiate between men and women. The feasibility analysis for the pilots found enormous differences within the group of women—sometimes greater differences than those between men and women—with regard to their needs, issues related to small-scale enterprises, and access to information. Differences were especially pronounced in polygamous households in project sites in Kenya and Zambia. In other cases, women (and men) cannot get involved in many or all small-scale business activities, ranging from producing field crops and vegetables to rearing (small) livestock and trading. Enterprises also operate on different levels, from (semi) subsistence farming with occasional sales of surplus to a substantial business with a provincial or national presence. The major challenge is still to identify the varied information needs among this diverse range of female and male farmers and to provide enough content that reflects those needs. The identification of information needs and development of content should not be based on gender alone but on additional relevant information from the target group, such as age, type and level of enterprise, household situation (polygamous, female-headed, number of school-age children, and other variables) and “what type of business, which value chain, and what operational level” farmers are involved in.

## CREATING AN ENABLING ENVIRONMENT

The stakeholder analysis confirms that the equity approach is the most preferred, feasible, and appropriate for the selected pilot sites. The ICT inventories and field surveys in Zambia and Kenya show that apart from gender, poverty and poverty-related issues in many areas determine the level and type of access to and use of ICTs for both men and women. For that reason, it is essential to promote an enabling environment for the rural poor (male and female) to use ICTs, through policies at the national level and within projects and programs. One suggestion from the workshop in Zambia was for ZICTA to develop a differentiated tariff structure for beneficiaries in rural areas and for service providers’ and developers’ payments.

<sup>27</sup> Digital Green Participatory extension videos for women in India at: <http://www.digitalgreen.org/>.



However, the use of ICTs and the creation of an enabling policy environment are not the sole answers to improving the access to and exchange of information. Apart from policies regarding the obvious infrastructure linked to ICTs—such as (subsidized) provision of electricity and infrastructure for mobile and internet networks—policies related to other infrastructure and institutions are indispensable as well, including the rural road network, input supply and output markets, service providers, education and adult literacy, and credit and saving facilities. The need for specific enabling national policies and strategies that cut across ministries, sectors, and agencies should be emphasized.

## DESIGNING TOOLS RELEVANT FOR WOMEN'S ENTERPRISES: ELEMENTS AND STEPS

In summary, to develop and implement ICT tools that are useful to women and which they can easily access, a number of key elements and steps should be considered. The iterative process described next continues throughout the design and implementation phases, with special adaptations to take women's needs into account. The process is based on an approach discussed in the *ICT in Agriculture e-Sourcebook* (World Bank 2011a) and on findings from this feasibility study.

### DEFINE THE TARGET GROUP AND SUBGROUPS

It is important to be able to define different types of groups and subgroups based on a range of variables such as the kinds of economic activities people pursue, where they are located, the level at which they operate, and most of all in this instance, the different information needs required for those activities to succeed and the constraints that individuals face in accessing ICTs. It also helps to identify the value chains with high levels of participation by women, as well as the women's specific information needs and constraints. This information will enable those involved in designing and implementing a project to differentiate the groups by size, determine if certain groups have overlapping needs or constraints, and identify the best means of engaging with those groups (for example, how best to involve them in training).

### IDENTIFY THE NEEDS OF THE TARGET GROUP AND SUBGROUPS

It is important to establish to what extent ICTs can actually address the needs of the target group and subgroups. For that purpose, the information on groups needs to be gender-disaggregated, examine the differences within the groups of female and male farmers, and consider the different levels of economic activity, and the different areas of the value chain, in which farmers are involved.

### CONDUCT A VALUE CHAIN ANALYSIS AND/OR DESCRIBE USE CASE SCENARIOS

A good understanding of the value chain identified for the project is important for determining if and how ICTs can assist the enterprises involved. Use case scenarios are a valuable tool for taking a critical look at potential ICT solutions, because they can (and should) be used to identify factors that could undermine the effectiveness of the tool. For example, farmers provided with average retail prices for commodities will find it hard to attain those prices outside urban areas and feel cheated when they realize they cannot get those prices; that outcome has the potential to undermine the trust built between buyers and sellers.

### SELECT OR DEVELOP THE ICT PLATFORM/TOOL

This part of the development process is crucial, as it involves identifying and/or developing the ICT tools or platforms that the target groups will use to meet the business needs identified previously. Ideally, the starting point is an extensive review of the literature or other information available on existing tools or platforms, undertaken before selecting and adapting a technology or developing a new one. In practice, however, little authoritative information may be available. ICT tools are often launched when they are first implemented, and their effectiveness is rarely examined after a few years have passed. Service providers are not inclined to provide detailed (business) information on commercial tools and platforms. The review of existing tools or platforms is a time-consuming, difficult exercise that requires a very detailed analysis of the tools—a literature study or internet search alone is never sufficient.

## CONSULT AND INVOLVE THE TARGET GROUP(S) IN DESIGNING THE ICT TOOL(S) OR PLATFORM(S)

A practical approach for verifying whether a candidate ICT is suitable and can be used by the target group (or groups) is to involve them in taking the candidate tool from a concept to a clear design. Initial assumptions can be verified at this stage. The developers will also gain an indication of the training and promotion that prospective users will need and the differences between men's and women's access to the tools. Detailed training and promotion plans can be developed that specifically target men and women.

## DEVELOP A BUSINESS MODEL FOR DEVELOPING, PROMOTING, AND RUNNING THE ICT PLATFORM

A financial plan is required to develop the ICT tool or platform, and a longer-term financial strategy is needed to cover the costs of promoting and running it, as well as training users to operate and maintain it—all of which are often substantially higher than the development costs alone. It is important to verify whether the users are able and willing to pay and how. Users should eventually be able to cover the entire cost of

the service, once it has enabled them to create new sources of revenue. If users face difficulties in paying for the service when a project is being implemented, it is unlikely that the tool will be used after the project has been completed.

## DEVELOP A PLAN THAT ENSURES THE CONTINUITY AND SUSTAINABILITY OF THE TOOL/PLATFORM

The sustainability and continuity of ICT tools is a major challenge for developers. Tools developed within a project often stop being used once the project has been completed. ICT tools can be sustained only when they are economically viable and are used by the target group to address their business needs. The tools should be supported by a profitable organization, such as a private enterprise that has embedded the tools within its activities. Such enterprises usually have the capacity and resources to provide reliable and current information and training, have an interest in updating and further developing the tool, and manifest a long-term commitment for managing the tool. In many countries, similar ICT tools are often run by farmers' unions or other member-based organizations, which have a mandate to provide information to members, among other activities.



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# APPENDIX A

## INITIAL DATA COLLECTION TOOL

### Guidelines for rapid data collection WE-ICT

#### IDSP project

#### Group discussions

#### Interview/meeting number:

Date of Meeting	Venue
Name of Facilitator(s)	GPS Coordinates

#### AGENDA:

- » Presentation of the pilot project
- » Goal of the focus group discussions
- » Ground rules
- » Introductions
- » Questions and Answers
- » Wrap-up

#### 1) Information on the participants/group participating in the data collection

#### MEETING: TYPE OF GROUP OR MEETING WITH INDIVIDUAL

Group (what kind)*				
Name (if applicable)				
In existence since (i.a.)				
Number of members	M>15:	M<15:	F>15:	F<15:
Provenance (village?)				
Objective				

\* For example, IDSP committee, women's group, cooperative, mixed group of community members, and so on.

<b>Individual</b>
<b>Name</b>
<b>Function</b>

## II) Specific data collection

### 1) Organizational structure (gender)

- » Are they organized in groups, committees (specific women, youth)? Is NGO, church, or government support provided in the area?
- » Where based: Which village or irrigation site?
- » What do they do, activities (where)?
- » Active/inactive?
- » Interaction with others, whom, what?
- » Details (especially women/youth groups): Phone numbers, contact person, e-mail address?

### 2) Educational facilities/situation (gender)

- » Where do children go to school: Name, type, distance, route, mode of transport.
- » Educational level of adults (male/female), youth, children (also in terms of school attendance).
- » Literacy level, understanding, reading, writing in the local language or English.
- » Languages spoken.

### 3) Livelihood activities (gender)

- » Agriculture: What, where, how, size, purpose, inputs, market, income, constraints, support?
- » Livestock: What, where, purpose, how many, market, income, constraints, support?
- » Other, examples: Employment, charcoal, beekeeping, fishing, mushroom collection, arts and crafts, self-employed, trading?
- » Small and medium enterprises specific to women/youth: Where, what, how, constraints?
- » How long have you been farming/running business/and so on?

- » If you are farming, do you own the land you farm? If not, who owns the land?

### 4) Daily Activity Clock

- » What does an average day look like?
- » How much time is devoted to productive activities (paid labor, employment, income generation)?
- » How much time is devoted to reproductive activities (unpaid labor for the household, childcare, cleaning, washing clothes, collecting water, firewood, caring for the sick)?
- » How much time is devoted to community activities (ceremonies, marriages, funerals, community)?
- » How much time is devoted to leisure (free time)?
- » How much time is devoted to sleep?

### 5) Communication, network

- » Means of communication: In/between villages, people, with “outside”?
- » Possession of mobile phones, who, type?
- » Use of mobile phones: Who, what, how, costs, how paid?
- » If not possession: Access to phone? How, when, limited or not, costs, how paid?
- » Access to network: Which, where, reliability, access to talk time (where, how)?
- » Using which language when using phone?
- » Radio (communication): Who owns, or has access, when, how, what type of communication and information, costs, and so on?
- » Computer: What, who owns, access, network, costs, and so on?

### 6) Electricity

- » Availability of electricity: Who, where, what?
- » What is used for lights, radios, cooking, telephone—electricity, alternative sources of electricity?
- » Average costs?
- » Access to electricity or alternative sources: Who, where, what, costs?

## **7) Transportation (gender)**

- » Important areas (for example market, town or hospital and distance).
- » Transport network (roads, paths), condition.
- » Transportation means (from where or whom, used for what).
- » Costs if applicable.
- » Constraints.

## **8) Specific women/youth (girls)**

- » Expectation of the IDSP project.
- » Current and future economic activities.
- » Needs and constraints.
- » Access to support, means.

- » Ownership of means.

- » Decision-making on use of means not owned (for example, phone of husband).

## **9) Challenges**

- » What challenges or constraints do you face as a farmer/entrepreneur?
- » What challenges do women farmers/entrepreneurs face?
- » What challenges do male farmers/entrepreneurs face?
- » Challenges of rural communities?
- » Challenges of female- and child-headed households?





## APPENDIX B

# CRITERIA FOR SITE AND VALUE CHAIN SELECTION, KENYA

## SELECTION OF VALUE CHAIN AND PROJECT SITES

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### IDENTIFY 2–3 BROAD-BASED VALUE CHAIN CATEGORIES

The existing value chains were categorized into broad agriculture produce sectors based on a list provided by KAPAP: fruit trees (mango, pawpaw, passion fruit, and so on); livestock (dairy milk, livestock meat—cattle, poultry); horticulture (tomatoes, onion bulbs, and so on); legumes; cereals (maize, wheat, and so on); and commercial crops (such as aloe vera).

### LOOK AT THE NUMBER OF GROUPS AND MEMBERS IN THE VALUE CHAINS

Higher number of groups and higher number of members will be an advantage when scaling up the intervention, and if a pilot is scaled up, it will be more attractive for service providers to serve a larger client base. As an example, the value chains with over 100 farmer groups and over 5,000 members are: tree fruits (mango, bananas); potatoes; local poultry; and dairy cows.

However, other criteria (listed below) are also important in the pilot phase:

- » The pilot has to test the hypotheses that the use of ICT tools will help women develop their businesses and advance along the value chain.
- » An important part of the pilot is to track capacity development and constantly monitor what happens: Is there uptake of the tool/platform? Does its use have benefits? Do these benefits translate into better businesses, better livelihoods, or some other advantage?
- » The bigger the numbers for the pilot, the more difficult it is to train and build capacity, and the more difficult it is to monitor (and evaluate) the results.

- » A (short/limited) baseline assessment of the current (individual) situation has to be carried out to make it possible to monitor and evaluate progress. Again, the bigger the group, the more difficult and time-consuming it will be to do a proper baseline.
- » Smaller groups and smaller numbers will be more manageable. The evaluation will need to assess and discuss whether the intervention can be scaled out/up.
- » Choose groups with a high(er) female membership.

## EARNINGS

KAPAP advised the study team that it would be more worthwhile to work in value chains where women are already earning additional income. KAPAP's experience is that value chains that are breaking even or operating at a loss have systemic challenges that may mask the impact of implementing ICT solutions, unless the ICT tool or platform was designed to address the specific systemic challenges. Value chains with positive earnings include: tree fruits (mangoes, pawpaws); poultry; legumes (groundnuts); aloe products; apiculture (but low female participation); and fish (but low earnings).

## LEVEL OF FARMER PARTICIPATION IN VALUE CHAIN

It is worth considering value chains that have a high level of (individual) farmer participation along the value chain, at the producing, processing, and marketing stage. It is also important to consider value chains that generate returns rapidly and operate all year as opposed to a short season during the year. For instance, poultry farmers produce birds all year and a production cycle is relatively short, whereas in fruit production (for example) it takes several years for trees to start producing, and most trees yield only for a short period each year.

## PLATFORMS AND TOOLS AVAILABLE

The producer groups in Kenya are much bigger and much more organized and commercially advanced than groups in Zambia. The groups are also mixed. Kenya already has more platforms or applications that might be useful for farmers (groups). The use and uptake of communication tools such as mobile phones, tablets, and computers is much higher in Kenya as well.

The approach in Kenya would therefore be to look at how to link the value chains (groups) to an **existing platform** or support them by providing **existing applications**:

- » For which of the value chain categories do platforms or apps exist that have proven to be successful?
- » If for some of the value chains nothing exists yet, they should not be considered at the moment.
- » If a platform or app is not specific for a value chain but is useful for a group regardless of the value chain, it has to be specified.

It must be borne in mind, however, that although Kenya has a larger number of ICT platforms, the number of **viable** platforms in terms of impact might be limited. Besides, it is important to link a possible ICT solution to felt needs/problems of the target groups.

## SELECTING A LOCATION

Locations (counties) for the pilot must be close together and have farmer groups participating in the chosen value chains. These locations will have high participation in agriculture and productive areas relatively near to each other (relatively, as they are close to Nairobi, but traveling between Embu and Nakuru, for example, can take half a day). Because the pilot study will be conducted for only a limited period, and to facilitate monitoring, choosing locations that are closer to each other and to Nairobi is justified, but it should be understood that this choice might have an impact on the outcomes of the pilot. Locations closer to Nairobi have the advantage of being closer to markets, customers, and better infrastructure (roads, electricity, networks, and so on), and they receive better support from the public and private sector. One can assume, all in all, that the conditions for agro-enterprises to develop are better. The effects of these advantages will definitely influence the possibilities for scaling up/out and have to be taken into consideration.

## VALUE CHAIN AND LOCATION SELECTED

In summary, the main questions and issues to consider in selecting locations and value chains are:

- » For which value chains do we have proven effective platforms or apps?
- » Which value chains have specific women's groups, higher involvement of women (and youth), but are

not too big and cumbersome to train, monitor, and evaluate?

- » In which situation can we hope to see results in the (short) testing period?

With locations, bear in mind what and how to evaluate and possibilities for extrapolating scaling up/out.

The **value chain** chosen in consultation with KAPAP is the **poultry production** value chain, for the following reasons. It has a large number of groups (not essential for the pilot but for scaling up and out). A relatively high percentage of women participate in this value chain. The value chain has a rapid financial turnover appropriate to the short pilot period. The groups are not too far away, which facilitates training and monitoring. It is possible to find groups that are mainly made up of women (and perhaps youth). An interesting, viable ICT platform is available to respond to the needs of women in this value chain.

Finally, women may already be involved at different levels in this value chain.

The **counties** proposed by KAPAP for further study were **Makueni, Kwale, and Gucha**. The criteria used in identifying these sites were: Each location has multiple poultry farmer groups; the groups have high financial turnover from poultry; the level of interest and participation of farmers in the value chain in these locations is high; the level of interest and participation of service providers for the farmer groups in these locations is high, and they are open to new ideas and innovations.

Makueni is relatively close to Nairobi (a drive of approximately two hours). Kwale and Gucha are between six and eight hours from Nairobi by road (in opposite directions from Nairobi). Data gathered on field trips to different counties provided insight into the potential logistical implications for the pilot.

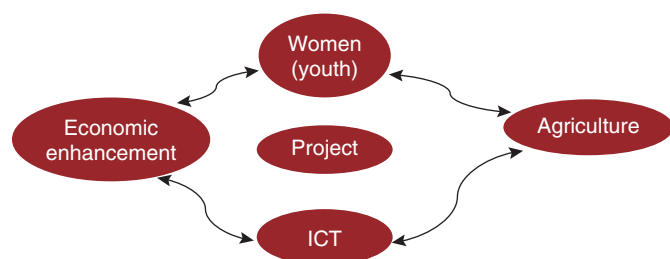


## APPENDIX C

# ZAMBIA WORKSHOP DISCUSSION AND RESULTS

Workshop participants divided into three groups, which held discussions on three topics: design and implementation, implementation and projects, and financial sustainability. Results of the discussions, conclusions, and recommendations are listed in tables C.1, C.2, and C.3. During the discussion, participants were asked to keep two basic questions in mind, as well as the overall context (figure C.1) as a guiding principle. The two questions were: Can ICT tools be used to empower women or enhance the economic empowerment of women in agriculture? How can they be used, how should they be developed, and what approach should or could be taken?

**FIGURE C.1.** OVERALL CONTEXT FOR PROPOSED PILOT





**TABLE C.1. GROUP I—DESIGN AND IMPLEMENTATION: RESULTS, CONCLUSIONS, AND RECOMMENDATIONS**

<b>Group I: Design and Implementation</b>	
<b>Discussion statement</b>	“To enable women to benefit from ICT tools or a specific ICT tool, the tool has to be designed with women as the target beneficiaries of these tools in mind, and not as a generic tool for everyone.”
» <i>Consider these issues during the discussion</i>	<ul style="list-style-type: none"> <li>• Target group men/women.</li> <li>• Size of the target groups.</li> <li>• Value chain(s) in agriculture or part of value chains.</li> <li>• Capacity (knowledge, financial, literacy, and so on).</li> <li>• Accessibility.</li> <li>• Needs and problems of women, men.</li> <li>• Use and administration/running of the platform.</li> <li>• Sustainability.</li> </ul>
<b>Conclusions and recommendations</b>	<ul style="list-style-type: none"> <li>• The tool should be generic but encourage female usage, add specific women’s group interests, which will depend on the value chains included in the platform (content).</li> <li>• Men and women are looking for the same information.</li> <li>• Project should target equal usage by men and women of the tool/platform.</li> <li>• A strategy should be developed to encourage women’s use of the tool, which could include adding interests specific to women, for example specific crops, value chains, and so on.</li> </ul>
<b>Key question</b>	“What are the key steps required for the design and implementation of an ICT tool/platform, and what are the critical/key elements that need to be included/considered?”
» <i>Consider these elements during the discussion</i>	<ul style="list-style-type: none"> <li>• Sustainability.</li> <li>• Target group (information needs, capacity, and so on).</li> <li>• Capacity of the organization.</li> <li>• Selection of platform/tools: Off the shelf/new or own development.</li> <li>• Development time and delays.</li> <li>• Promotional and training requirements.</li> <li>• Administration.</li> <li>• Continuity.</li> <li>• Running costs.</li> <li>• Development costs.</li> <li>• Quality of the data (useful actionable data).</li> </ul>
<b>Conclusions and recommendations</b>	<p>Steps required for the development of the implementation of an ICT tool/platform:</p> <ul style="list-style-type: none"> <li>• Identify needs of farmer groups.</li> <li>• Define target group and subgroups.</li> <li>• Do a value chain analysis and/or describe use case scenarios.</li> <li>• Develop concept design.</li> <li>• Consult the target group on the concept design(s).</li> <li>• Select the platform tool; do an extensive (literature) review of existing tools/platforms before developing a new platform or selecting/adapting an existing tool/platform.</li> <li>• Develop financial plan for the development, promotion, and running of the platform.</li> <li>• Develop a plan that ensures the continuity and sustainability of the tool/platform.</li> <li>• Organization should be able to sustain the platform in the long run by incorporating other organizations, users, and so on.</li> </ul> <p>The process described above is an iterative process and will continue throughout the design phase and even during the implementation phase.</p>

**TABLE C.2. GROUP II—IMPLEMENTATION AND PROJECTS: RESULTS, CONCLUSIONS, AND RECOMMENDATIONS**

<b>Group II: Implementation and Projects</b>	
<b>Discussion statement</b>	“An ICT project for the enhancement of women (gender) should not be appended to an existing project but should be fully integrated in the design of the project.”
» <i>Consider these issues during the discussion</i>	<ul style="list-style-type: none"> <li>• Target group men/women.</li> <li>• Needs and problems of women, men.</li> <li>• Timing of the activities.</li> <li>• Duration of the activities.</li> <li>• Value chain(s) in agriculture or part of value chains.</li> <li>• Project staff involvement, training, capacity.</li> <li>• Implementation and management of the ICT tools.</li> <li>• Use and administration/running of the platform.</li> <li>• Sustainability.</li> </ul>
<b>Conclusions and recommendations</b>	<ul style="list-style-type: none"> <li>• An ICT project for the enhancement of women should be fully integrated in the design of the project.</li> <li>• Setting up an ICT tool takes time and should therefore be customized (integrated).</li> <li>• All key stakeholders should participate fully in the planning, design, and implementation.</li> <li>• It would be important to target households (not just women; sensitize men).</li> </ul>
<b>Key questions</b>	<ol style="list-style-type: none"> <li>1. Does the IDSP see a need for the design and use of ICT tools in the project (with a gender perspective)? If yes, why and for what? If not, why not?</li> <li>2. Can the ICT tool designed for the pilot be implemented in the IDSP program, and if so, how? If not, why not?</li> </ol>
» <i>Consider these issues during the discussion</i>	<ul style="list-style-type: none"> <li>• Who should be the users of the platform (one site, all sites, women’s groups, youth, and so on)?</li> <li>• Value chain(s) in agriculture or part of value chains.</li> <li>• At what stage of the IDSP program should it be implemented?</li> <li>• Who should be running it? IDSP, MAL, external organization, others?</li> <li>• Current pilot design developed while no irrigation system was in place; need for re-design?</li> <li>• Sustainability.</li> </ul>
<b>Conclusions and recommendations</b>	<ol style="list-style-type: none"> <li>1. IDSP should explore further the options for linking up with existing platforms such as the iDE (vegetables) and ZNFU.</li> <li>2. The concept for the pilot has not been tested, so it is difficult to say if it could/should be implemented. <ul style="list-style-type: none"> <li>• The tablet as a tool is challenging in terms of sustainability (costs, maintenance).</li> <li>• Consider purchasing solar panel with it (<i>was already part of the concept</i>).</li> <li>• It would be better for farmers to use a smartphone instead of a tablet, as it would be cheaper to use and is portable.</li> </ul> </li> </ol>
<b>Points discussed:</b>	<ul style="list-style-type: none"> <li>• ICT intervention, just as any other component, should be embedded in the design of a project to guarantee that the costs (development and running), human resources, and knowledge needed are considered and included.</li> <li>• If an ICT project would be appended, that project should come with the full resources to design and implement it. It cannot be expected that staff from the original project will take on extra tasks to implement and run it. They will be overloaded and might not have the required skills and knowledge.</li> <li>• Training is needed at all levels to be incorporated in the design.</li> <li>• It is good to introduce concepts right from the start, prepare for implementation (even if it will not be implemented right from the start), but developing tools or linking up takes a lot of time and finance; training (also literacy) can be provided before.</li> <li>• Look at dynamics at the household level, identify needs and gaps for women, but don’t exclude the men. Men will eventually accept women’s participation and pull out. Men should be sensitized and have to get on board. Involve youth as well.</li> <li>• IDSP has gender as cross-cutting issue, not activities only women. However, it is possible that the majority of participants could be women.</li> </ul>

**TABLE C.3. GROUP III—FINANCING AND SUSTAINABILITY: RESULTS, CONCLUSIONS, AND RECOMMENDATIONS**

<b>Group III: Financing and Sustainability</b>	
<b>Discussion statement</b>	“ICT tools/platform development and implementation are unsustainable by definition for the intended target group (women in the rural project areas) and will always have to be financially supported.”
» <i>Consider these issues during the discussion</i>	<ul style="list-style-type: none"> <li>• Women’s ownership of or access to assets (land, finance, equipment, knowledge).</li> <li>• Reality in the rural areas: Women more involved in subsistence farming; what should be the target group, (part) value chain.</li> <li>• Volume/size of the target group.</li> <li>• Cost-benefit analysis.</li> <li>• ICT is like a “start-up”; needs support for a long time before it becomes profitable in any case.</li> <li>• Support for the poor and women in relation to profitability.</li> <li>• Sustainability.</li> </ul>
<b>Conclusions and recommendations</b>	<ul style="list-style-type: none"> <li>• Women’s ownership and access to assets important.</li> <li>• Without market development, ICTs will not work.</li> <li>• Target group in subsistence farming doesn’t seem to need ICT at the moment.</li> <li>• But ICT can be used to provide information on nutrition, crop diversification, value chain productivity.</li> <li>• Extremely large target group—dilute focus.</li> <li>• Small client group—not profitable.</li> <li>• Cost-benefit analysis: Great asymmetry between costs and benefits—great cost for providers, large benefit for consumers.</li> </ul>
<b>Key question</b>	“What role should or can be played by the World Bank, Ministry of Agriculture and Livestock, ZICTA, and other stakeholders to make sure that these tools move from project stage to sustainable enterprises?”
» <i>Consider these issues during the discussion</i>	<ul style="list-style-type: none"> <li>• High prices for access to internet/phone network.</li> <li>• Charges by ZICTA.</li> <li>• Target group in the rural areas.</li> <li>• Sharing of information platforms.</li> <li>• Long-term funding requirements.</li> <li>• Stumbling blocks.</li> <li>• Enabling environment.</li> <li>• National, regional, and sector policies.</li> <li>• Business models.</li> </ul>
<b>Conclusions and recommendations</b>	<ul style="list-style-type: none"> <li>• What’s the policy? Full of hope but with very little substance.</li> <li>• Policy needs reform.</li> <li>• Cost regulation—importance of tariff structure to benefit rural users in agriculture.</li> <li>• Poor network coverage in areas where client groups are situated.</li> <li>• No business model; need one to demonstrate profitability and productivity.</li> <li>• No ICT without productivity; business model needs to target productivity.</li> <li>• ZICTA could help to reduce costs by categorizing clients in terms of charges, have different tariff according to the target group.</li> <li>• Stakeholders need to engage with policy makers—increase their awareness of ICT and its importance in enhancing agricultural productivity, link it to the bigger picture of food security and eradication of extreme poverty.</li> <li>• There should also be cross ministerial/policy maker dialogue (MAL, ZICTA, Ministry of Information, and so on).</li> </ul>

**TABLE C.3. GROUP III—FINANCING AND SUSTAINABILITY: RESULTS, CONCLUSIONS, AND RECOMMENDATIONS** (*Continued*)

**Group III: Financing and Sustainability**

**Points discussed:**

**Why is women's ownership of or access to assets important?**

- In order to improve livelihood—for example, by getting finance/loan—assets become very important.
- Access is unequal to that of men.
- Inequitable access should be redressed by special intervention.
- Can we change access or provide another opportunity for women?
- Reach a woman, reach a whole family. For instance, according to the World Bank's *Gender in Agriculture* sourcebook, if women farmers in Zambia had the same access to capital as men, agricultural productivity would increase by 15 percent.
- IDSP concentrating on land issue:
  - Women have access but are not decision makers on use and produce of land.
  - There is a causal relationship with women's rights to productive assets and provision of information.
  - Information is essential.
  - So under IDSP each wife in marriage (including polygamous marriages) should be allocated an irrigation plot in her own name and receive relevant information on how to make the land productive, on marketing, and so on.

**Involvement in subsistence farming**

- What information should be provided?
  - Nutrition.
  - Crop diversification and diversification of diet.
  - Access to water.
  - Weather information.
  - Extension model—selection of crops, production, and so on.
  - Information on sustainability.
  - Different categories of subsistence farmers, information will depend on which category—for example, those moving from subsistence to emergent/commercial farming will want more information on:
    - Marketing and productivity rather than nutrition and diet alone.
    - Increasing yields.
    - Efficient use of available resources.

It is important to provide opportunities for farmers to advance along the value chain. ICT is important, but different information will be required depending on the category of the subsistence farmer.

**Volume/size of target groups**

- Discussion/focus groups of 25–30
- If more people accept the messages, groups will grow and can be split/segmented further.
- The ICT platform can be segmented to smaller groups according to what information is provided.
- The target group size has to be chosen carefully—it can't be too small because it won't be sustainable, and it can't be too large because the information will be diluted.

**Cost-benefit analysis (CBA)**

- CBA is worthwhile, but how can it be done when there is no business model?
- It is possible to do a monitoring exercise at the end of the pilot.
- Existing platforms (for example, ZNFU) already doing CBA:
  - Costs are very high for the service provider; pay ZICTA, mobile network provider, and so on.
  - Great benefits for target group, affordable and worthwhile for end user.
- There has to be a very large market (target group) for service provider to make any profit.
- There is disequilibria in costs between service provider and end user.
- What can be done to reduce costs?
  - ZICTA, government policy formulation.

There is no real business model; if there was, the business community would already be involved in a major way.

(*Continued*)

**TABLE C.3.** GROUP III—FINANCING AND SUSTAINABILITY: RESULTS, CONCLUSIONS, AND RECOMMENDATIONS (*Continued*)

Group III: Financing and Sustainability
<b>Is ICT like a start up?</b> <ul style="list-style-type: none"><li>• ICT intervention cannot happen alone.<ul style="list-style-type: none"><li>– Needs complementary infrastructure to work: good transport network; delivery services; markets; marketing services; agents; wholesalers.</li></ul></li></ul>
<b>Agents: Are they good or bad for women entrepreneurs?</b> <ul style="list-style-type: none"><li>• Help in dealing with buyer intimidation.</li><li>• Help with storage for goods.</li><li>• Help with transportation of goods.</li><li>• Women may have to travel long distances with heavy loads to get to markets; agents can help with this.</li><li>• Facilitate bulk buying.</li><li>• Most agents work on commission, so they will get highest price possible to maximize commission and income/profit for clients.</li><li>• However, some “agents” take advantage of women; they buy cheaply from them and sell at much higher prices, causing losses to producers.</li></ul>

## APPENDIX D

# ZAMBIA PILOT CONCEPT PROPOSAL

An inventory of the use of ICTs in Zambia focused on the availability of ICT tools that can or have the potential to be used by small-scale agricultural enterprises. The inventory revealed that although uptake of ICTs has been very strong, especially uptake of mobile phones, the number of tools available for the agricultural sector is very limited. The main findings are:

- » None of the inventoried ICT tools were developed specifically for women, and none addressed women's specific needs.
- » Very few tools (developed, implemented, and piloted) targeted small-scale farmers in Zambia.
- » A number of competing mobile banking platforms operate in Zambia but none has taken off on a large scale.
- » ZNFU's market information service has been running for six years and delivers relevant market information using SMS text messaging, but its use is limited to nonperishable crops/products.
- » NAIS and the meteorological department deliver information using various traditional methods of communication of which radio has the largest audience.
- » Two services in development have the potential to be used by small-scale farmers and traders. Their design seems promising for the cost-effective delivery of relevant information to farmers. However these two services are still in development:
  - *ZNFU E-extension* services, providing general extension information.
  - *Lima Links*, a market information service for vegetable growers.
- » The *I-school* project is an interactive learning platform of high quality, which exposes youths to the world of ICT but has no direct relevance for improving women businesses.

## WOMEN'S ECONOMIC ACTIVITIES AT THE PROJECT SITES

To develop ICT tools capable of enhancing women's agro-enterprises in Lusitu, Mwomboshi, and Musakashi, the team first needed to collect information on the women in these areas: how they are organized, what their economic activities are,



the limiting factors in their economic development, and what they envision as their options to improve their economic and business activities. The main findings are listed in table D.1.

Table D.2 presents some additional observations related to ICT use at the three sites.

**TABLE D.1. AGRICULTURAL AND BUSINESS ACTIVITIES OF WOMEN AND WOMEN'S GROUPS AT THE THREE STUDY SITES, ZAMBIA**

Lusitu	Mwomboshi	Musakashi
<ul style="list-style-type: none"> <li>• The main livelihood is farming; 95 percent of the people are subsistence farmers.</li> <li>• Food shortages are a yearly occurrence.</li> <li>• Rape, tomatoes, and cabbages are sold by the women in the local markets; in general, the women get very little income from this trade.</li> <li>• Okra is sold to traders from the Soweto market in Lusaka, but not by women.</li> <li>• Women own and sell small livestock: chickens, ducks, goats, and sheep.</li> <li>• Livestock (goats, sheep, and cattle) are seen as wealth; the sale of an animal is considered a loss and is done when there is an acute need for money.</li> <li>• Small livestock are sold at the roadside or to traders who come to the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Small-scale farming, mainly maize production and vegetables.</li> <li>• Farm is not seen as a business. Households produce for own consumption or for selling vegetables in local markets to meet basic needs.</li> <li>• A few women's groups are involved in income-generating activities: producing mats, knitting baby clothes and jerseys, fish farming, and goat keeping.</li> <li>• It needs to be verified how active and successful the groups are as businesses.</li> <li>• A number of large-scale farmers are in the area and are part of IDSP.</li> </ul>	<ul style="list-style-type: none"> <li>• Population are "retirees," graduates from a nearby agricultural college, and ex-farm workers.</li> <li>• 50 percent of the farmers are over 50; only 12 percent younger than 30.</li> <li>• Farm is not seen as a business. Households produce for own consumption or for selling vegetables in local markets to meet basic needs.</li> <li>• Women are not really involved in "business" activities related to farming or livestock. They do produce and sometimes sell vegetables in the area or in neighboring markets.</li> <li>• Some women buy vegetables and sell them to meet (immediate) household needs.</li> <li>• Some women are part of the Musakashi Dairy Cooperative, which produces and processes milk.</li> </ul>

**TABLE D.2. OBSERVATIONS RELATED TO ICT USE AT THE THREE STUDY SITES, ZAMBIA**

Lusitu	Mwomboshi	Musakashi
<ul style="list-style-type: none"> <li>• The literacy level, in particular among women, is very low.</li> <li>• The use of phones, although growing, has not yet reached all households.</li> <li>• Information on markets and prices is virtually nonexistent but also of relatively minor interest for the small-scale farmers because of the low volumes produced.</li> <li>• Electricity is only available at the clinic, except for some solar power in a few households.</li> <li>• The road network is very bad, especially during the rainy season.</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity provision is low; only one person interviewed has electricity.</li> <li>• Ownership of phones is higher for men than women, and more widespread than the other sites.</li> <li>• Some (male) farmers use phones to get prices on inputs or market prices; women mainly use the phone to communicate with relatives.</li> <li>• Radio is the most widely used medium for information on agricultural practices and prices; farmer listening groups exist in the area.</li> <li>• Reasons for not owning a phone are costs and not knowing how to use a phone.</li> <li>• Text messaging is hardly used; men and women don't know how to text or cannot read or write.</li> </ul>	<ul style="list-style-type: none"> <li>• At least half of the farmers own a phone or have access to one.</li> <li>• A large number of people cannot read or write, but some are well educated and have used computers.</li> <li>• There is hardly any electricity in the area. Only four farmers have an electricity connection.</li> <li>• The road network is very bad; it is difficult to bring produce to markets or to come to the area.</li> </ul>

## OPTIONS FOR THE INTRODUCTION OF ICT TOOLS

The idea of the ICT pilot is to introduce women (and youth) in the three IDSP sites to existing ICT tools (or link them with existing ICT platforms) with the aim of improving their businesses. The analysis of available ICT tools found that none can provide relevant information for the businesses of women or women's groups. Two alternative approaches were examined:

1. Distributing mobile phones to women or women's groups.
2. Introducing ICT tools that will link the women to companies and organizations active in the area.

For the development of the pilot, it is vital to recognize that the three sites are different. As an approach to development, the pilot will be “one size DOES NOT fit all,” because technical and socioeconomic/cultural differences clearly prevail across the sites. The Lusitu site is the most challenging and more sensitive setting for various reasons. For that reason, the design of the pilot takes Lusitu as the starting point. The ICT option chosen for Lusitu will be adapted to the specific context of the other two sites.

### OPTION 1: DISTRIBUTE MOBILE PHONES TO WOMEN OR WOMEN'S GROUPS

The first option that was considered was the distribution of mobile phones to women or women's groups, as suggested during discussions with the World Bank. The rationale for distributing phones to women is that most women do not own phones and only have access to them through their husbands, other family members, or friends and neighbors. If women own phones, they can use them to improve their businesses through calling, text messaging, or using applications. However, there are no indications that the distribution of phones by itself would help to improve women's businesses in the three sites, particularly in Lusitu, where women's enterprises are the least developed. The distribution of phones is not a priority option for the following reasons:

- » A phone does not necessarily help women to reach customers for their vegetable trade. They do not have specific customers but rather sell to passersby; it would therefore be difficult to determine who to phone.

- » The cost of one call to a customer would be equivalent to the entire value of the sale to that customer.
- » No ICT platforms or applications available for mobile phones could contribute to the businesses of the women (in Lusitu).

There is also the risk that introducing phones to women who have very little income might further deplete their income. Phone ownership leads to extra expenses, like talk time and money for charging the phone battery. A recent study in Kenya finds that low-income groups often spend money on talk time they cannot afford; to buy talk time, they skip meals or walk rather than take public transport. The introduction of irrigated crop production through the IDSP will definitely increase the volumes produced and thus the volumes available to be marketed, and participants will be linked to marketing support, but that situation is still a few years away.

### OPTION 2: INTRODUCE ICT TOOLS LINKING WOMEN TO ORGANIZATIONS/ COMPANIES IN THE AREA

Option number two is to link the target group(s) to companies, organizations, and institutions that are active in their respective areas or to companies and traders operating within the value chains where the women are involved. These links would be made by providing the women's groups with tablets or smartphones that are able to connect to the internet.

A solution whereby women's groups use e-mail on tablets or smartphones to communicate with information providers would enable all members of the group to access the information. The use of email has the additional advantage that much more relevant information can be sent than can be communicated through a phone call—for example, booklets on production methods from the Ministry of Agriculture.

The assumption is that the use of tablets/smartphones to send and receive e-mail will help the women (and others) to obtain information on prices, receive requests from traders visiting the area to buy produce, obtain information on markets, and access other relevant information from private companies, other organizations, and public agencies active in the area. All of that information would

subsequently contribute to improving women's business skills and incomes.

Another assumption is that organizations, institutions, and private companies active in the area are willing and able to provide relevant information to the groups. In the Lusitu area, such organizations, institutions, and companies were identified and approached to see if they were able to participate.

## PILOT DESIGN

The second option, "Introducing ICT tools that will link the women to companies, organizations, and institutions active in the area," was selected for further development as a pilot project. This option entails facilitating the creation of a network of information providers and others who seek information—in other words, a network of information exchange, in which women's groups are a central part.

The pilot will target all three sites and select five existing women's groups at each site. Groups will be selected in a participatory way with the communities, based on a number of minimum criteria to guarantee that the groups will be able to use the tool:

- » At least some of the women in the group should be literate.
- » The group should be active and meet on a regular basis.
- » At the very least, the women should be involved in a value chain that is partly commercial or for which private sector actors are present in the area (examples for Lusitu include the value chains for vegetables, goats, and sorghum)
- » The value chain should preferably be "active" the whole year round and not seasonal (for piloting purposes mainly).
- » Of the women's groups identified, a maximum of five per site will be selected for the pilot.

The groups will use tablets with an email application. Tablets were selected over smartphones because:

- » Tablets enable the women to send, receive, and store e-mails.
- » Tablets have a bigger screen than phones, which makes it easier to read and type a message (especially true for the older generation).

- » Although prices of tablets are still high, they are falling, so tablets are considered a potentially affordable platform for communication in the agricultural sector.
- » Tablets can be charged with a solar charger that can also be used to charge mobile phones.

## INTERVENTION

The pilot entails the provision of a tablet to each of the five (maximum) selected women's groups in each of the three sites. Tablets will also be provided to the IDSP committees which are being established in each of the three sites, the block or camp extension officers from the Ministry of Agriculture and Livestock, and the IDSP liaison officer.

The project will purchase the tablets with an inbuilt SIM-card enabling them to connect to the internet, purchase the solar chargers, and pay the costs of communication to eliminate the risk that the initial cost will deter women from using them. The contribution toward the communication cost will gradually be reduced to zero toward the end of the pilot. The communication cost of the tablet will eventually have to be paid for by the women's groups themselves.

It is estimated that the amount of bandwidth needed for e-mail and basic internet browsing will not exceed 500MB per group per month. This means that the groups will spend about US\$21 (K 105) per month for their internet connection. Awareness of the costs involved and of the cost-efficient use of the tablet will be an important part of the training provided to the women's groups.

At the three sites, people pay at least K 1.50 to charge their phones. Using the solar chargers to support a phone-charging business could enable the groups to generate revenue and pay for the internet connection costs of their tablets.

The women's groups will be trained to use the tablets, although it is recognized that the distribution of tablets and training will not enable the women to enhance their businesses. For that reason, a key element of the pilot is to involve private companies and organizations that provide services and information. In each of the sites an initial inventory of relevant service providers, companies, and organizations was carried out. To gauge whether local companies and organizations

would be willing to participate—on which the entire pilot depends—the companies and organizations identified in the Lusitu area were approached and introduced to the concept. The organization and companies willing to participate in the pilot for Lusitu site are listed in table D.3.

## PILOT IMPLEMENTATION

The pilot will consist of the following phases: preparation, training, implementation, and evaluation.

### PREPARATION PHASE

In the preparation phase, further consultations will be held with the companies and organizations involved in the pilot, and with the communities and women's groups, to develop a communication structure and strategy and a training program. At the same time, the monitoring and evaluation tools will be developed, and tablets and solar chargers will be procured.

**Consultations with companies, organizations, and institutions.** The team will extend and intensify contacts with companies, organizations, and other information providers active in the three sites to establish what concrete activities they are engaged in, their communication needs with the farmers, the types of information they can provide, and their willingness to be actively involved in the pilot. More specifically, the team will:

- » Collect detailed information on their activities in the areas.
- » Find out the people and groups with whom they work and their gender policies/strategies, if any.
- » Find out how they communicate with the individuals and groups.
- » Find out what information they need from the individuals and groups and how they collect it.
- » Find out what type of information the people and groups in the area need from the companies and organizations, and verify if the companies and organizations are able to provide this information.

**TABLE D.3. ORGANIZATIONS AND COMPANIES EXPRESSING WILLINGNESS TO PARTICIPATE IN THE PILOT IN THE LUSITU AREA**

Organization or Company	Activities	Information Provided
LIMA Scheme	A ZNFU-coordinated scheme whereby farmer groups receive inputs and loans to pay for the inputs. In Lusitu the scheme focuses on sorghum, for which the Zambian breweries provide a readily available market.	<ul style="list-style-type: none"> <li>• Announcements of field days, training, and other information</li> <li>• Answering questions on growing sorghum.</li> <li>• Link with extension officers responsible for extension work.</li> </ul>
SAPP	A small livestock project under SAPP, whereby a private company is setting up a trading post for small livestock.	<ul style="list-style-type: none"> <li>• Market prices and linkages to traders who are willing to buy small livestock.</li> </ul>
Extension staff, MAL	Lusitu has a block extension officer, a camp extension officer is located in the Sitinkwe area, and veterinary officers are based in Chirundu.	<ul style="list-style-type: none"> <li>• Ministry extension staff are key players in providing information to farmers regarding inputs provided by government, vaccination of animals, and linking farmers to traders and markets.</li> </ul>
NAIS	NAIS provides agricultural information via radio, TV, internet, and print media.	<ul style="list-style-type: none"> <li>• Information on crop production methods, livestock rearing, and disease control.</li> </ul>
ZNFU 4455	This SMS-based market information platform provides market prices for 16 commodities from 200 companies. The information is also available on the internet.	<ul style="list-style-type: none"> <li>• Market price information.</li> </ul>

*Note:* ZNFU: Zambian National Farmers Union; MAL: Ministry of Agriculture and Livestock; NAIS: National Agricultural Information Service of the Ministry of Agriculture and Livestock; SAPP: Smallholder Agri-business Promotion Program.

- » Find out how the introduction of e-mail communication with the people and groups in the sites can improve communication for their companies/organizations.

**Consultations with the communities and women's groups.** Each of the three sites has a number of women's and other groups (cooperatives, clubs, and so forth). It is not yet clear how active these groups are or what their specific objectives and activities are. This stage will verify and establish which women's groups exist in the area, where they are located, how often they meet, what their objectives and activities are, their information needs, and the literacy levels of the groups. Based on this information, the groups will be selected.

**Analysis and development of the communication structure and information network.** With the information collected from the women's groups, companies, and organizations, the team will develop a communication structure to make sure that the tools provided will cater for their needs. To address the risk that the users of the platform will not get the information they seek, that they will be overloaded with irrelevant information, or that they will receive information in a language or format they do not understand, the information needs of the women are matched with the information that can be provided by the various information and service providers.

**Procurement and purchase of hardware.** The tablets and solar chargers for the women's groups, the IDSP committees, and liaison officers (Camp or Block Extension Officers) of the Ministry of Agriculture and Livestock will be bought.

## TRAINING PHASE

The main objective of the training is for the women, by the end of the training period, to be able to use the tablets as an effective communication tool for collecting relevant information for their businesses and for effective communication to improve their businesses.<sup>28</sup> To achieve that objective, the training will have two components: use of

the technology and contextualizing the use of the technology.

**Use of the technology.** A detailed training program will be developed to instruct the women's groups in the basis use of the tablet. The trained groups will always have at least one person who is literate and will include youths, who tend to adopt new ICTs quickly.<sup>29</sup>

**Contextualizing the use of the technology.** The women's groups will be trained to use the tablet as an effective information and communication tool through a very practical approach based on the women's real information needs. For the training, the participating organizations and companies are invited to explain what information they can provide, explain what information they need from the women's groups, and how to communicate with them. Another important part of the training will be to teach the women to use the technology cost-effectively and discuss the possibility of generating income to pay for some of the communication costs of the tablets by using the solar chargers to establish a phone charging business.

## IMPLEMENTATION PHASE

During the implementation phase (eight to nine months), the women's groups and others provided with tablets will be expected to use them for effective communication. During this phase, the groups will be provided with support, and their use of the tablets will be monitored. Regular follow-up and contacts with service providers and other actors in the pilot will take place during the implementation phase. Monitoring will also be executed by the relevant department of the IDSP and Ministry of Agriculture and Livestock.

## MONITORING AND EVALUATION

A specific monitoring tool will be developed during the preparation phase. The monitoring and evaluation will follow a two-pronged approach:

<sup>28</sup> Even though the women's groups are not really economic enterprises/businesses, the groups are involved in activities in which (small) financial transactions are made.

<sup>29</sup> A similar approach was used in Cambodia by the ICT technical team member, with very good results.



**TABLE D.4. RISKS AND ASSUMPTIONS RELATED TO PILOTING ICT WITH WOMEN'S GROUPS, ZAMBIA**

Risks	Description	Mitigation
<b>Use of the technology</b>	The groups need to be able to use the technology.	<ul style="list-style-type: none"> <li>Groups are selected with members who can read and write.</li> <li>Youths are included, as they are often quick to take up ICTs.</li> <li>Extensive training will be provided.</li> </ul>
<b>Relevant information</b>	The users need to find relevant information in the system.	<ul style="list-style-type: none"> <li>The system is designed to enable users to connect to different information providers.</li> <li>The group will be trained to use the system and learn how and where to get the appropriate information.</li> </ul>
<b>Sustainability</b>	The groups need to pay for internet access, which is about US\$0.21 per month.	<ul style="list-style-type: none"> <li>The running costs are relatively low.</li> <li>The groups can use the solar chargers to generate income by charging mobile phones.</li> </ul>

**TABLE D.5. BUDGET FOR HARDWARE AND COMMUNICATION COSTS, ICT PILOT WITH WOMEN'S GROUPS, ZAMBIA**

Item	Quantity	Unit price (K)	Total (K)	Total (US\$)
Tablets and solar chargers	10 per site, total 30 tablets	44.820	134.460	25.612
Subsidy on tablet use, decreasing (not included MAL staff)	500 MB per month, first 4 months per group, 5 groups per site	105	6.300	1.200
	250 MB per month next 2 months, 5 groups per site	70	2.100	400
		<b>Total</b>	142.860	27.212

Note: Budget excludes cost of training and support activities. Exchange rate: US\$1 = K 5.25.

- » Monitoring and evaluation of the actual usage and communication network (uptake of the tool).
- » Monitoring and evaluation of the actual results achieved through the use of tablets and communication network (in other words, determining whether the uptake provides positive results).

Regular monitoring will also enable the team to provide additional support to the users and address issues as they arise. This aspect of the pilot will be important, because it is very likely that issues will come up that could compromise use of the platform. The monitoring and evaluation will also look at how the pilot's targeting of women through women's groups and of (female) youth has affected cultural and household relations.

## RISKS AND ASSUMPTIONS

Some risks related to the implementation of the pilot will have to be mitigated to the extent possible. Table D.4 identifies the main risks and assumptions anticipated to be involved in the pilot.

## BUDGET

The budget presented for the pilot intervention in the three IDSP sites (table D.5) includes the hardware that needs to be purchased and the communication costs for the groups. Excluded from the budget are the costs for training and support activities.





## APPENDIX E

# KENYA PILOT CONCEPT PROPOSAL

This workplan is a detailed guide for KAPAP to implement the poultry ICT tool that TechnoServe developed for its poultry farmer groups. The workplan briefly describes the poultry ICT tool and a detailed plan for implementing the tool; presents a detailed budget for implementing the tool, training the groups, and providing support for the groups; and develops a timetable for implementing the tool.

## THE ICT TOOL

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The poultry business ICT tool is a software package that enables groups engaged in commercial poultry production to collect business data, create reports, and do the accounting to manage their business activities. The poultry software has the following functionality:

- » Electronically captures data on the farmers in the group and presents it at various levels (an individual farmer as a group member, a shareholder, and a supplier, for example).
- » Electronically captures sales of chickens by registered farmers.
- » Tracks product rejects.
- » Electronically generates supplier receipts for each farmer.
- » Electronically captures the purchase of chickens by registered buyers/traders.
- » Electronically provides financial account statements for registered suppliers.
- » Assigns a credit facility to registered suppliers.
- » Generates the supplier payroll and transfers/credits the various payment accounts registered by the farmer.
- » Generates various account reports for all business transactions of the poultry producer groups.
- » Provides an affordable information messaging platform through an SMS module between the farmers and all stakeholders around the poultry producer groups.
- » Consolidates data from all poultry producer groups to give a complete overview of all purchases of chickens from farmers and poultry producer groups at any time.

# WORKPLAN

## PHASE 1: PLANNING AND PREPARATION PHASE

**Time frame:** Estimated to be 2 weeks

**Task:** Set up an agreement with TechnoServe, evaluate the software tool, request a detailed implementation plan and budget from the software developers, develop the contract for the software developers.

The aim of the planning and preparation phase is for KAPAP to gain a full understanding of the functionality of the tool, the time requirements, the steps required for the implementation, and all the costs involved. The result of this phase should be an agreement/contract with the software development company for the implementation of the tool.

**Choice of service provider and collaborative agreement.** The first step in the planning and preparation phase is that KAPAP will engage with candidate service providers who are engaged in developing relevant ICT tools and platforms. Two options currently being developed are the Poultry Producer Group Management Software developed for TechnoServe Kenya (an adaptation of EasyMa) and CoopWorks, originally developed for the dairy value chain but now also use in the coffee and (soon) maize value chains. The status of the ICT tool and the farmer groups must be assessed:

- » What is the status of the tool and when will they implement?
- » What are the requirements for the groups to run the platform, staff, infrastructure, running costs?
- » Have they decided if the groups will use the tool so it can connect to a server on the internet?
- » Who will pay for the costs of running the tool?
- » Who will pay the administrator of the tool?
- » How will the training be conducted, and are training modules already developed?
- » How will the groups be supported financially and technically in running the tools?
- » What agreement is there with the software developers for the next phase?
- » How and in which areas can KAPAP and the service provider collaborate in the implementation of the tool?

**Engage with the service provider.** The second step in the planning and preparation phase is to engage with the software company that developed the poultry software. The company will be responsible for the implementation and support of the tool. A meeting needs to be set up to discuss:

- » Presentation of the software tool by the software company.
- » The readiness of the tool and the required time to implement.
- » The readiness and time required to include the two additional software modules, the on-farm data module, and the SMS messaging module.
- » Request a workplan/implementation plan with the elements listed in box E.1.

The outcomes/deliverables of this phase are:

1. Agreement signed with the ICT tool and platform provider.
2. Areas identified and agreed upon where KAPAP and the provider can collaborate.
3. Poultry software presentation by the software company to provide a good understanding of the functionality and the status of the tool.
4. Receive detailed workplan, training plan, support plan, and budget from the software company.

## PHASE 2: PILOTING

**Time frame:** 6 months

**Task:** Implement the solution, train the user, address and resolve any issues with the tool.

The piloting of the tool will be done in the three selected sites and will be based upon the agreed workplan/implementation plan provided by the software company.

The deliverables from the software company are:

1. Introduction/sensitization of the groups.
2. Installation of the hardware and software.
3. Training of the users of the software.
4. Implementation and training report.

Required inputs from KAPAP:

1. Organization of meetings and training venues for the sensitization workshop and the two software training sessions.

## BOX E.1. ELEMENTS REQUESTED IN SERVICE PROVIDER'S WORKPLAN/IMPLEMENTATION PLAN

### 1. Implementation plan, which should include:

- List of all staff members involved in the pilot with their details, roles and responsibilities.
- Technical specifications of the tool.
- Required software and hardware.
- Details of all the steps required for the pilot, installation, training, support, and evaluation.
- How women farmers are targeted in the use of the tool.
- Detailed time plan for all the activities.
- Roles and responsibilities of the software company and KAPAP.

### 2. Training plan, which should include:

- Objectives.
- Development of the training modules.
- Time plan.
- Sensitization/training of the groups, which should include the costs of the tool and the contributions required by the groups.
- Training the users of the software, for each group, 3 group members, including women.
- Training of KAPAP staff and service providers.
- Follow-up training for the two additional software modules.
- The roles and responsibilities of the software company and KAPAP.

### 3. User and technical support plan, which should include:

- Support for the installation of the software and software upgrades.
- Follow-up training support.

- Call out/filed visits support.
- Remote or help line support.
- Response time to software issues, bugs, requests for support.
- The roles and responsibilities of the software company and KAPAP.

### 4. Detailed budget (based on the budget in this document), which should include:

- Cost overview.
- Detailed costing for hardware, software, training, support, running costs, support of the groups and evaluation.

### 5. Evaluation plan, which should include:

- Objectives, which should include the following key questions:
  - Does the tool enhance the business of the women farmers and the groups? If so, how?
  - What are the recommendations to scale up the pilot and introduce the tool to other groups?
  - What are the costs for new groups to acquire the tool?
  - What are the costs for KAPAP to scale up the tool?
  - Are the users able to effectively use the tool?
  - Do the groups have the capacity to run the tool?
  - Do the groups have the capacity to pay for the running costs?
  - What is the support required for the groups to run the tool?
- Methodology.
- Workplan.

- Organization of lunch/refreshment for the participants during training.
- Selection of three group members from each group to administer the software; the selection of the group members should be done in collaboration with the groups.
- Office space with electricity and a clerk where the system can be set up.
- KAPAP staff and service provider staff available during the training so they are also informed/trained.

During the period of the pilot (six months), the software company will provide technical and user support according to the detailed support plan. The deliverables from the software company in this phase are:

- Technical support.
- User support.

## PHASE 3: EVALUATION

The software company will do an evaluation of the pilot based on the evaluation plan.

Deliverables:

- A baseline study.
- An evaluation report.

## ONGOING SUPPORT AND MONITORING DURING PHASE 2

<b>Time frame:</b>	Continuous support for 6 months
<b>Task:</b>	Continued support to the users and troubleshooting.

Required input from KAPAP:

1. Execute the baseline study (approximately 5 days).
2. Monitoring and evaluation staff need to allocate about 10 days for monitoring and evaluation.

## BUDGET

### SUMMARY OF COSTS

The budget in this report was the outcome of discussions with software development companies. The costs are summarized in table E.1; the costs are for the all the hardware, software, software upgrades, installation, ongoing support, and financial support to the groups to run the tool for a period of 6 months. A breakdown of all the costs is found in the sections that follow.

### BREAKDOWN OF COSTS

**Hardware and software.** The hardware, software, and installation costs are the components of the cost of implementing the ICT solution in the three sites. The software company will be responsible for the purchase of the hardware, software, and the installation.

*Hardware costs* are listed in table E.2, which contains a breakdown of the hardware required, including a modem for the users to connect to the internet. For the groups, a desktop computer was selected with a UPS as power backup. This solution has limitations in areas with frequent power cuts, however. An alternative is to use a laptop, which uses less power and can operate when there are

**TABLE E.1. SUMMARY OF COSTS FOR THE HARDWARE, SOFTWARE, AND ACTIVITIES**

Summary of All Costs	Cost (US\$)
1. Hardware costs	3,945
2. Software costs	6,540
3. Software additional modules cost	1,650
4. Group sensitization workshop	3,870
5. Software training	1,925
6. Development of training materials	950
7. Software and user support	14,550
8. Evaluation	2,700
9. Financial support running costs groups	3,840
<b>Total:</b>	<b>39,970</b>

frequent power cuts; the drawback is that laptops have a higher risk of being stolen or personalized.

*Software costs* include the poultry software for the three sites, Microsoft Windows and Office, and the software licenses for the database. The costs also include installing and setting up the software and hardware on the computers. A detailed breakdown of the software costs appears in table E.3.

*Additional software modules* are needed to make the software more functional, based on the needs of the poultry producer groups. The two additional modules will allow the groups to track on-farm production data (to improve planning) and to send SMS messages to individual farmers in the group. These modules are not included in the current version of the software; they still need to be developed and implemented by the software company. A detailed breakdown of the additional software costs is found in table E.4.

**TABLE E.2. HARDWARE COSTS**

Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Computer	3	765	2,295
Modem	3	25	75
Small receipts printer	3	180	540
Standard printer	3	250	750
Backup UPS	3	95	285
<b>Total:</b>			<b>3,945</b>

**TABLE E.3. SOFTWARE COSTS**

Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Poultry software for 3 sites including set up and installation	1	4,500	4,500
Microsoft Windows 7	3	200	600
Microsoft Office	3	247	741
Server User License 2012	3	28	84
SQL Server User License 2012	3	205	615
<b>Total:</b>			<b>6,540</b>

**TABLE E.4. COSTS OF ADDITIONAL SOFTWARE MODULES AND INSTALLATION**

Item	Quantity (days)	Unit Costs (US\$)	Total Cost (US\$)
On farm production data module	5	150	750
SMS alert module	5	150	750
Installation on 4 computers	1	150	150
<b>Total:</b>			<b>1,650</b>

**Training.** The software company will be responsible for developing a training program and conducting the training. The training program includes the training/sensitization of the groups, training the users of the software, a follow-up training for the use of the additional software modules, and the development of the training materials.

*The group sensitization workshop* will be the first activity of the training program and will focus on the group members. The group members will be informed about the software platform, its uses, the responsibilities of those involved, and other topics. The content of the training will be developed by the software company in collaboration with KAPAP. Table E.5 presents a detailed breakdown of the costs of the group sensitization workshop.

*Software training* will be provided for the users/operators of the software in two sessions. The first training session (for a period of two days) will train one person from each CWG to use the software. The second training session will provide instruction in how to use the two additional modules. The second session will be offered as soon as the modules are developed and implemented. The cost of software training is broken down by component in table E.6.

*Training modules and materials.* The software company will be responsible for developing the training modules and the training materials. The associated costs are shown in table E.7.

**Software and user support.** The software company will provide technical and user support to the groups

**TABLE E.5. COST OF GROUP SENSITIZATION WORKSHOP**

Training of 12 CWGs (3 CIGs with 4 CWGs each; 2 CWGs will be trained together for 1 day)			
Item	Quantity (days)	Unit Costs (US\$)	Total Cost (US\$)
Fees ICT junior ICT staff	6	300	1,800
Fees ICT senior ICT staff	6	150	900
Car rental	6	80	480
Fuel	6	65	390
Driver	6	50	300
<b>Total:</b>			<b>3,870</b>

**TABLE E.6. COST OF SOFTWARE TRAINING**

Training of 12 people, 1 person per CWG; initial 2 days of training for the software; an additional day of training will be provided on the additional two modules			
Item	Quantity (days)	Unit Costs (US\$)	Total Cost (US\$)
Fees ICT junior ICT staff	3	300	900
Fees ICT senior ICT staff	3	150	450
Car rental	3	80	240
Fuel	3	65	185
Driver	3	50	150
<b>Total:</b>			<b>1,925</b>

**TABLE E.7. COSTS OF DEVELOPING AND PRODUCING TRAINING MATERIALS**

Training modules will be developed for the group sensitization workshop and the training of the workshop			
Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Training modules development	5 days	150	750
Printing costs training materials	1	200	200
<b>Total:</b>			<b>950</b>

**TABLE E.8. COSTS OF SOFTWARE AND USER SUPPORT**

Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Fees for support management/coordinator	6 months	300	1,800
Remote support/help line	6 months	400	2,400
Planned field visits/on the job training (12 visits)	12 days	150	1,800
Call out support/field visit (3 visits times 6 months)	18 days	150	2,700
Car rental	30 days	80	2,400
Fuel	30 days	65	1,950
Driver	30 days	50	1,500
		<b>Total:</b>	<b>14,550</b>

through planned field visits, which will function as a follow-up to the training to ensure that the groups are able to use the software platform effectively. Additional support will be provided to the users by the software company remotely over the phone (remote support/help line). In cases where the issue cannot be resolved over the phone, the software company will make a call out support/field visit.

As seen in table E.8, a total of 12 planned field visits will be done by the software team. An additional 18 call out/field visits have been budgeted. For the remote support/help line and the support coordinator, a flat fee will be charged each month.

**Evaluation.** Evaluation of the piloting of the poultry tool will be done according to the evaluation plan. Nine days are allocated for the evaluation. The final deliverable will be the evaluation report. The costs of the evaluation are presented in table E.9.

**TABLE E.9. COSTS OF EVALUATION**

**The software company will conduct an evaluation of the use and impact of the poultry ICT tool as described in the evaluation plan**

Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Fees for senior ICT consultant	9 days	300	2,700
		<b>Total:</b>	<b>2,700</b>

**Financial support to groups for operating the ICT platform.** The pilot will support the cost to the groups of running the ICT platform over the **six-month** pilot period. The costs include sending SMS messages through the platform (10 SMS per farmer per month), monthly costs for the SMS short code, internet access, and a hosting fee that enables the platform to link to a central server. See table E.10.

**TABLE E.10. COSTS OF FINANCIAL SUPPORT TO GROUPS RUNNING THE ICT PLATFORM**

<b>The groups will be provided with financial support for running the platform for 6 months</b>			
Item	Quantity	Unit Costs (US\$)	Total Cost (US\$)
Costs sending 10 SMS messages per farmer per month; 10 SMS * 140 farmers * 3 CIGs * 6 months = 25200 SMS messages	25,200	0.06	1,512
Hosting costs for the server which collects the data from the groups, 3 groups for 6 months	18	40	720
SMS short code	6 months	118	708
Internet access for 3 groups for 6 months	18	50	900
		<b>Total:</b>	<b>3,840</b>



## ESTIMATED TIME FRAME

**TABLE E.11.** ESTIMATED TIME FRAME

	Week																	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	//	31	32	33	
Preparation phase for KAPAP, meetings with TechnoServe and software developers																		
Develop detailed work-plan by software developers and signing contract																		
Mobilize staff and groups for the training																		
Purchase hardware and software and installation																		
Training/sensitization of the groups																		
Software training																		
Baseline study																		
The groups start to use the software																		
Support provided by the software company																		
Baseline study																		
Evaluation																		

Note: KAPAP = ■; software development company = ■; groups = ■.



## APPENDIX F

# DISCUSSION OF THE ENABLERS/ STRATEGIES

### **ENABLER 1: CONDUCT A GENDER ANALYSIS TO IDENTIFY OPPORTUNITIES FOR ICTs TO ENHANCE CURRENT PRACTICES**

- To capture what information and services men and women need and how they are currently meeting those needs.
- To assess what ICTs are already in use and the type of access men and women have to them.

The initial reviews and surveys for the project found that very little gender-disaggregated data is available; the majority of background documents for IDSP provide general information on the socio-economic and cultural situation in the project sites, without presenting specific data on women and men, let alone on youth (boys and girls). A study/training program financed by the World Bank Trust Fund for Environmental and Social Development on gender and social mainstreaming in the IDSP (NIRAS 2011) provided very useful information on gender and social issues but was not a baseline with gender-disaggregated data. KAPAP collects information through its monitoring program, which includes gender-disaggregated data, such as data on the performance of various value chains (mixed interest groups) with a high percentage of women participants. However, in Kenya as in Zambia, for the purpose of the ICT-WE project more specific gender-disaggregated baseline information was needed, in particular related to the following;

- » What are women (including youth/girls) in the different sites involved in, on-farm and off-farm? Do they have any income-generating activities (on- and off-farm)?
- » Marketing activities or any other businesses, bottlenecks, challenges, needs.
- » Future plans and possibilities.
- » Information and communication needs (on what, when, how, from whom).

- » Information and communication exchange for women (how do they get information, how do they give information, on what, to whom, how, and so on).
- » Access to and control over ICT-related assets: radio, TV, telephone (type), computer, other.
- » Literacy level, which languages.
- » Control over their own time (for example, to listen to radio, to go to market, and so on).
- » Access to finance (how to pay for telephone use, electricity, talk time); willingness and ability to pay for services.
- » Possibilities for buying/selling ICT-related things: phones, SIM cards, talk time, chargers, batteries.
- » Electricity infrastructure or the lack thereof, communications network (telephone, internet), other sources of power available (solar) (Imani 2012d).

Only limited gender analyses were carried out for both Zambia and Kenya for the ICT-WE pilot. The field visits, focus group discussions, and stakeholder meetings provided broad information on the issues listed above and the overall situation of men and women in the project areas. With this information, the team was able to elaborate initial ideas for the pilot concepts in both countries, which were to be discussed and elaborated further with the target groups. Specific baseline surveys were to be carried out with the selected groups at the start of the pilot implementation phase, to be able to evaluate the main question of the pilot. The baseline surveys did not take place, however, as the pilot was terminated before going into the implementation phase.

**Observation:** *A gender analysis of a project target group or communities within a target area will provide general information on differences between men and women regarding assets, information needs, access and control, and so on. Yet for the purpose of the ICT pilot project and other ICT interventions in general, the differentiation between men and women is not enough. **Within** the group of women and men there are enormous differences, sometimes more than **between** men and women, with regard to the questions raised above and to access and needs. This is especially true for the ICT-WE project, where (for instance) polygamy was reported in the sites in both Kenya and Zambia. These differences have implications (for*

*example, in the level of access to resources and information, decision making and control).*

## ENABLER 2: DEVELOP APPROPRIATE CONTENT TO MEET THE NEEDS OF WOMEN AND MEN FARMERS

- Women and men farmers do not always share the same information needs.
- For ICT applications to improve the productivity of women and men farmers, it is necessary to ensure that appropriate content is developed for them.

The inventories of ICT platforms and tools in both Kenya and Zambia revealed that in general:

- » There are only a few tools that are able to deliver relevant (access to) information for the (small-scale) agricultural sector (Zambia).
- » Of the many tools developed that are linked to the agricultural sector, only a few have proven successful, and for many other tools no impact analysis is done or available (Kenya).
- » There are no tools that are developed specifically for female users or from a gender perspective.

The participants at the final workshop in Zambia discussed, among other things, the statement: “To enable women to benefit from ICT tools or a specific ICT tool, the tool has to be designed with women as the target beneficiaries of these tools in mind, and not as a generic tool for everyone.” The outcome of the discussion was that the approach should be to develop generic tools, but that the use of the tools by women should be promoted and encouraged through the content that is offered, which could include content that is linked to specific value chains that have higher female participation. It was stated that the development and implementation of “specific tools for women” would not be sustainable as the user base, especially in the rural areas, would be too small, which would prevent the development and implementation of such tools from being economically viable and interesting for private ICT providers.

The concepts developed for both Zambia and Kenya did use generic tools that were available. The tool to be used

in Zambia (tablets as a communication tool) would allow women to exchange exactly the information that is relevant to them. The creation of an initial network of service providers, traders, private sector players, and other stakeholders matched the interests and needs of the specific women's groups. The poultry management software in Kenya allows for the generation and exchange of information relevant for women and men members of the local poultry CIGs, and it provides the opportunity for individual (female) farmers to know "how their business is doing."

**Observation:** *The challenge, as noted before, is that women are not a uniform group, and neither are men; they are either not involved in any business activities at all or in a large variety of business activities, ranging from field crop and vegetable production to rearing (small) livestock and trading. The enterprises also operate on different levels, from (semi) subsistence farming involving occasional sales of produce to substantial businesses with provincial or national outreach. To identify the information needs and to provide sufficient (and sufficiently interesting) content to this diverse range of female and male farmers remains the major challenge. Content should not be based on gender as such but on "what type of business, which value chain, and what operational level" farmers are involved in.*

### ENABLER 3: CONSIDER USING A RANGE OF ICTs

- Practitioners should recognize the infrastructure constraints as well as gender-based constraints that can limit the effectiveness of technologies.
- Programs need to identify which ICTs are most appropriate for overcoming specific constraints and avoid the temptation to design programs around ICTs.

The concepts developed for Zambia and Kenya were based on what was available in the market and what responded to the needs of women (and men) in the specific area and value chain. In both countries a combination of tools and functionalities was chosen.

For **Zambia**, a tablet was chosen as a communication tool to be used in groups, to facilitate the groups' communication with other stakeholders. Known constraints that were considered included:

- » **Female literacy levels are relatively low.**  
The tablets are to be used in a group; the reality

is that in the groups there will always be someone who can read and write, as confirmed by other ICT practitioners during the final workshop in Zambia.

- » **Difficulties using mobile (smart) phone for messages.** Apart from literacy levels, the utility of smartphones was limited by their small screens, which women found difficult to read. Tablets have a larger screen and are therefore easier to read.
- » **Dissemination and transmission of information via word of mouth.** Information often gets distorted or highly condensed when transmitted verbally. Information sent to tablets can be stored and accessed whenever the groups or individuals need it.
- » **Electricity provision in the area.** Tablets would be used with special solar power chargers, which would enable the women's groups to have an additional income-generating activity (charging mobile phones for a fee).
- » **Numerous information providers and seekers.** The tablets have an internet function and a phone function, which makes them very versatile to use. When groups become more advanced in their use of the tablets, they can access existing platforms such as the ZNFU and iDE platforms and liaise directly with the NAIS from the Ministry of Agriculture and other stakeholders.

For **Kenya**, where the majority of farmers have mobile phones and where, for instance, mobile banking has already penetrated farther into rural areas, a software program was chosen for local poultry producers, the majority of whom are women. The software provides information to the individual members of poultry groups on "their farm as a business," as well as management information for the poultry group as a whole. The platform/software chosen can be used on a desktop or laptop computer and combines a record-keeping function with information exchange via SMS (mobile phones), hard copies of individual farm reports (if so desired by farmers) via printed statements, and a savings and banking service via mobile banking.

**Observation:** *The combination of a range of ICTs, or use of a versatile tool/platform (a strategy proposed in the pilot concepts) is in itself no guarantee that women will have improved access to information. The success of the pilot in Zambia would initially depend very much on the nature and actions of the network created around the women's groups and the content this network of stakeholders would provide (enabler 2). When the groups would be more advanced in the use of the tool, a more directed search for content would enable the women to access and exchange relevant information, assuming that other platforms exist that "provide what they are looking for."*

*The tool in Kenya combines the use of electronic record keeping with information exchange by mobile phone and paper statements. For those farmers that have no access to mobile phones or who cannot read and write, the use of the tool should complement other information channels (enabler 4).*

#### **ENABLER 4: USE ICTs TO COMPLEMENT EXISTING INFORMATION CHANNELS**

- Women farmers especially rely on the exchange of information through word of mouth.
- ICT can support and enhance these information channels by providing access to expertise and more up-to-date information.

Women's information channels are very often their neighbors or the members of a group to which they belong, be it a church, a production club, or an informal savings group, for instance. When developing the pilot concepts for Zambia and Kenya, the approach was to work with existing groups, to facilitate the exchange of information. Working with groups has the additional advantage that most, if not all, groups have some women who know how to read and write. Groups usually have an organizational structure that includes leadership roles such as chairperson, treasurer, and secretary. Requirements for these roles, in women's groups as well, more often than not include a certain literacy level.

The advantage of using a tablet for sharing information, as proposed in Zambia, is that information can be stored and retrieved whenever it is needed, without the risk that it will be distorted or partly lost, which often happens when it is transmitted by word of mouth. Tablets also provide an opportunity to share information with a larger number

of interested stakeholders, be they information seekers or providers.

Similarly in Kenya, where the CIGs are in a more advanced stage of group and business development, the chosen platform allows the information to be exchanged between the groups and individual farmers (SMS alerts, money exchange, information on prices and input and output markets) and the possibility for farmers to have an insight into the performance of the group's business and their own individual business through electronic or printed statements, for example. Furthermore, the requirement to have an office space for the computer and data people creates a central meeting place for the groups, where informal and formal exchange can take place.

**Observation:** *The notion that the use of ICTs is not the only answer to solving the problems of access to and exchange of information, in particular for women farmers, is important, and even more so when taking into consideration the differences **within** the group of female and male farmers, as observed (enabler 1).*

#### **ENABLER 5: DEVELOP DIRECT RELATIONSHIPS WITH MEN AND WOMEN FARMERS**

- Most recent ICT innovations will fail to bring women into agricultural programs if leaders and practitioners are not intentional about engaging women directly.
- Buyers, extension agents, input suppliers, and other service providers must reward the appropriate individuals for their participation in the value chain.

The ICT-WE pilot project was proposed as an addition to existing agricultural projects, to be executed by a consultant, during a limited time and with the specific objective to test whether the use of ICT tools could enhance women's businesses. When the project was initiated, KAPAP was already in its second phase, while IDSP was officially launched a few months after the pilot started. This set-up did not permit strong relationships to be developed with the men and women, local leadership, and other stakeholders in the target areas, and not even with the staff of the projects. The fact that the timing of the pilot did not coincide with developments in the main project contributed to the decision that the pilots could not be implemented in either country. The workshop in

Zambia discussed the advantages and disadvantages of an ICT project that is added to an existing project. Participants concluded that to develop and use ICT in the project context, the technology should be integrated in the design of the project, and the necessary resources and time should be allocated. This approach would allow for the development of direct relationships, provide a better understanding of the needs of different target groups, and improve the timing and use of a variety of ICT tools related to the project context.

**Observation:** *The integration of the use of ICT tools in the design of projects does not mean that by the start of the project the exact tools or platforms and the way that they will be used will already be identified. It does, however, allow for the development or identification of tools that respond to particular needs in the project, and it provides the opportunity to consider the sustainability of particular tools/platforms right from the start.*

#### **ENABLER 6: IDENTIFY EMPLOYMENT OPPORTUNITIES FOR WOMEN WITH AGRICULTURE-RELATED ICT SERVICE PROVIDERS**

- To date, little research has examined the potential for creating new ICT-related employment opportunities for men and women in agriculture.
- Two areas suggested provide opportunities for women: (i) women employed as call center consultants delivering agricultural information to farmers and (ii) rural women recruited and trained at the village level to act as information intermediaries for other farmers.

The ICT-WE project was designed as a pilot, linked to two existing agricultural projects. It was not the intention to look into possibilities for women to find formal employment in providing services related to ICT. That said, the concepts that were developed considered the opportunities for women and their groups to use the proposed solutions to generate additional income. The proposed solution for the groups in Zambia included the options that:

- » The tablets could be used for providing information exchange possibilities to others, creating an “information center/hub.”
- » The solar power chargers could be used for charging mobile phones of others against a fee.

In Kenya, the poultry groups have organized a central place where the computer/laptop would be based and which would serve as an office and collection center for birds from group members;

- » This central office could also serve as an information and communication center/hub where others can access information.
- » The groups will have to employ a data clerk, who will be paid by the members for the service; opportunities exist for female members to be a data clerk or be part of a team of data clerks.

**Observation:** *The strategy of identifying employment opportunities for women with ICT service providers related to agriculture or as information intermediaries will apply only to a small and defined group. The opportunities to use ICT tools for additional income-generating activities might be more widespread, however, and attainable for a larger and more diverse group of female farmers.*

#### **ENABLER 7: DESIGN TWO-WAY ICT PROGRAMS TO COLLECT AND DISSEMINATE INFORMATION**

- The transmission of information through ICTs must consider not only “pushing out” but also “pulling in” information.
- In gathering data on farmers, it is critical to ensure that the data are sex-disaggregated, to improve the understanding of the gender-based constraints and opportunities in agriculture.

The concept in Zambia was specifically designed with “two-way communication” in mind. The tool would provide the women’s groups with a means to receive information and communication from service providers, the private sector (buyers, input providers, and others), IDSP, and all others interested in communicating with the groups, initially through e-mail. The groups would also be able to send information on their products, availability, prices, and the group’s development through e-mails, reports, and alerts to interested parties. When the groups would be more developed and more conversant with the use of tablets, use of the internet would open up a whole range of possibilities for communication and information exchange.



The Kenya concept equally provides possibilities for two-way communication by combining the use of poultry software on the computer/laptop with services linked to mobile phone communication. KAPAP and service providers, traders, and others can communicate directly with the groups, while the groups can provide up-to-date information to the same stakeholders, be it regular reports for KAPAP monitoring (with gender-disaggregated data) or stock and price information for buyers, or information on the prevalence of diseases for researchers, for example.

**Observation:** *While it is critical to ensure that the data collected are disaggregated by gender, it should be stressed that additional relevant information on age, type and level of enterprise, household situation (such as polygamous or female-headed households, numbers of school-age children), and characteristics within the group of female and male farmers is collected. As stated, the differences in needs, access, and control can sometimes be larger within the female and male farmers groups than between them.*

#### **ENABLER 8: DEVELOP GENDER-EQUITABLE NATIONAL OR REGIONAL ICT POLICY**

- ICTs can only have a positive impact on women's lives if infrastructure reaches them and appropriate policies and programs are in place to address poverty and gender issues in accessing and using ICTs.

The ICT-WE project had to work within the current policy context in the two countries. Both countries have a national gender policy in place, and both are developing gender policies for the agricultural sector. National ICT policies exist in both countries, but as they date to 2006, they are being revised.

During the workshop in Zambia, the problems and bottlenecks for rural (poor) farmers, and particularly female farmers, to access and use ICTs were discussed, along with the role that could be played by national governments, international and national (donor) institutions, and ICT agencies to facilitate sustainability. The discussion was based on the following statements/questions:

- » The development and implementation of ICT tools/platforms is unsustainable by definition for

the intended target group (women in the rural project areas) and will always have to be financially supported.

- » What role can or should be played by the Ministry of Agriculture, ZICTA (Zambia), World Bank, and other stakeholders to make sure that these tools move from the project stage to sustainable enterprises?

The various surveys as well as presentations and discussions with stakeholders in the workshop corroborated the view that it is impractical and unsustainable to develop ICT tools specifically for female farmers and entrepreneurs. The critical mass needed for an economically viable tool or platform would be difficult to reach, and it is even doubtful that such a specific tool is needed. Moreover, the ICT inventories and field surveys in Zambia and Kenya confirmed that in many areas it is poverty and poverty-related issues that determine the level and type of access to and use of ICTs among women as well as men.

The role that is often played by international and national donors and projects is that of funders and subsidy providers for the development, implementation, and long-term running of tools and platforms. An equally important role, however, which is part of the above strategy and validated by the Zambia workshop, should be to engage with national policy makers—to increase awareness of the importance of ICT in enhancing agricultural productivity, and to advocate the necessity of including policies that facilitate improved access to ICTs for rural men and women.

**Observation:** *Apart from policies regarding the obvious infrastructure linked to ICTs, such as (subsidized) provision of electricity and mobile and internet networks, other infrastructure and institutions are indispensable, such as rural roads, input supply and output markets, service providers, education and adult literacy, and credit and saving facilities. The need for specific national policies and strategies that cut across ministries, sectors, and agencies that will enhance the access to and profitable use of ICTs by female and male rural farmers and entrepreneurs should be emphasized.*

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