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Rapid Appraisal of the ICT for Agricultural Extension Landscape in TANZANIA

January 2013

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Submitted to USAID on January 24, 2013

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Introduction and Caveats

This is one of three rapid appraisals prepared on the Information Communication technology (ICT) for agricultural extension landscape for Ghana, Tanzania and Ethiopia, three New Alliance countries. The appraisals were conducted primarily as “desk studies” from the US during December 2012 and early January 2013. They were conducted in order to provide potential New Alliance ICT Challenge Grant applicants with information on apparently promising uses of ICT to extend the reach and impact of agriculture extension and advisory services so that such applicants would be able to consider which organizations and services they might include in their grant application or proposed teams. They also provide an overview of each country’s ICT landscape.

An applicant may know more about the organizations and services identified or know of other organizations or services not included. “Promising” options identified in each study may or may not be so promising given the time available to prepare the studies. Further, given an evolving ICT landscape and the resources accessed for the study, the appraisals may include errors or omissions or be outdated by the time the ICT Challenge Fund Request of Applications is issued. Also one point of concern identified was that a number services listed may not be sustainable without on-going donor support; may not have been evaluated to assess their impact; nor may they be appropriately scalable to meet the goals of the New Alliance. Challenges and strategies are also subjective and may be inaccurate. In short, the appraisals are provided just as one source of information for potential grant applicants to consider.

Executive Summary

The following report is a rapid desk review that focuses on the use of Information and communication technologies (ICT) and the current ICT landscape in Tanzania. ICT have been identified as having real potential to improve the effectiveness of existing agricultural extension efforts in developing country scenarios. Over the past 25 years, the government of Tanzania has recognized the potential of ICTs in national development and has in fact initiated a series of shifts in policies and investments. However, the government spends only about 7% of its annual budget on the agricultural sector, which accounts for vast majority of national economic activity.

Various ICT initiatives focused on increasing agricultural productivity have been implemented by both for-profit and not-for-profit non-governmental organizations in Tanzania. To date, those initiatives that have utilized radio and cell phone networks to complement existing agricultural extension have proved most successful in conveying reliable and applicable information to rural farmers. Additionally, mobile cinemas have proved to be successful in environmental education and hold great potential in agricultural extension. Nevertheless, significant challenges have also been encountered, including poor radio and cell phone reception, lack of credible information

sources, and lack of awareness on the part of the target audience (the farmers) of the services already available. The apparently promising options for future success are those capable of extending beyond what they are being used for today, thus taking advantage of existing networks, relationships, and experiences to address these challenges and fulfill as-yet unmet needs. Key stakeholders in this success will include trustworthy providers of applicable information; sustainable providers of ICT services; and committed donors.

Information and communication tools such as cell phones, the internet, radio, and television can dramatically improve farmers' and intermediaries' access to information relevant for rural households, production agriculture, and agribusinesses. The tools can be used to raise awareness or to provide specific information in response to questions about agricultural technologies, markets, prices, etc. As such these tools are just a part of the extension process and are most effective if combined with established good extension practice.

For extension in general and for ICT in particular to be effective, the service has to be **client focused** and **needs driven**, providing **credible content** and a **relevant as well as actionable message** through a **trusted messenger**. Furthermore, access to information is just part of the formula for success. Farmers have to see sufficient evidence that they are convinced to turn the new information received into 1) a willingness to test the approach and then 2) if the test is successful, adopt. Success of an IC tool or approach therefore also depends on **availability of required inputs**, **sufficient knowledge** to test and use those inputs appropriately, and **access to markets** for them to profitably sell their outputs.

Introduction

While face to face interactions may still be considered the best method of effective communication in extension (Molony, 2008) more often than not, extension agents struggle to meet their clients in a timely or regular manner, particularly in developing countries, where infrastructure, budgets, and other factors can severely limit service provision to rural poor. Information and communication technologies (ICT)s have emerged as complementary tools to deliver and improve agricultural extension services, allowing different stakeholders to interact across geographic barriers in nearly real time. ICTs, such as cell phones, the Internet, radio, and television, can dramatically improve farmers' and intermediaries' access to information relevant for rural households, production agriculture, and agribusinesses. The tools can be used to raise awareness or to provide specific information in response to questions about agricultural technologies, markets, prices, etc. Nevertheless, these tools are just a part of the extension process, and are most effective if combined with established good extension practice.

The ICT Landscape

Country Profile

The United Republic of Tanzania in Eastern Africa is bordered by Kenya, Uganda, Burundi, Rwanda, the Democratic Republic of Congo, Zambia, Malawi, Mozambique, and the Indian Ocean. With a surface area of 945,087 km² and an estimated population of about 47 million (2012), the country is divided into 30 regions and is home to more than 120 different ethnic groups (CIA 2012). Religious preference is generally evenly split between Islam, Christianity, and traditional beliefs. Population growth currently stands at just under 3%, with a per capita GDP of 1,600 USD. While the official language of the courts is English, Swahili is the unifying language of the country's different ethnic groups, each of which actually has their own language (Masebo and Nyangwine, nd). These are usually the first language learned, with Swahili and English learned later in schooling (Lewis, 2009). Dar es Salaam is the commercial capital of Tanzania and major seaport for many of the neighboring landlocked countries (CIA, 2012). Refer to Table 8 Appendix A below for more demographic information.

Economy

While agriculture accounts for more than 25% of Tanzanian GDP, providing 85% of exports and employing about 80% of the work force, the country's average 7% annual GDP growth over the past decade has been principally attributed to mineral production and banking reforms (Tan Serve, 2008). Prominent agricultural products include coffee, tea, cotton, cashews, tobacco, clove, fruits, vegetables, and livestock (CIA, 2012). The government spends about 7% of its budget on agriculture. However, "price controls and unreliable cash flow to farmers continue to hamper growth in the agricultural sector." (Heritage Foundation, 2012). In fact, a recent survey of 4,000 farmers in Tanzania revealed that more than 75% see access to markets as a major obstacle. Nearly 60% cited access to finance as a challenge. (Winter, 2012) With 30% of the national budget dependent upon bilateral donor assistance from institutions such as the World Bank and the IMF, the country is pursuing economic advancement through the development of intra-African important trade links, such as rail and port infrastructure (Heritage Foundation, 2012).

Telecommunication Sector Policy and Regulatory Status

In 2003 the Tanzanian government approved the National ICT Policy (NICTP). The policy's vision is for "Tanzania to become a hub of ICT Infrastructure and ICT solutions that enhance sustainable socioeconomic development and accelerated poverty reduction both nationally and globally" (URT, 2003). Additionally, the International Telecommunication Construction Corporation of China is constructing the 5,300km Tanzanian National Information Communications Technology Broadband Backbone infrastructure (TeleGeography, 2012). In addition, Tanzania has joined with the International Telecommunications Union (ITU) and other member countries of the Southern African Development Cooperation (SADC) to convert to digital broadcasting. As of December 31, 2012, 23% of the country had officially migrated from analogue to digital technology (Rugonzibwa, 2013).

The Tanzania Telecommunications Regulatory Authority (TCRA) was established in 2003 via the NICTP as an independent authority for the regulation and licensing of postal, broadcasting and electronic communications industries in Tanzania. The agency oversees the Regulation of Tanzania Communication Commission and the Tanzania Broadcasting Commission (TBC). The parent ministry is the Ministry for Communications, Science and Technology, which operates under the Tanzania Commission of Science and Technology. (Materu-Behitsa, Diyamett, 2010)

The TCRA is charged with implementing the National Strategy for Growth and Poverty Reduction, which aims to promote the use of ICT in rural areas specifically through telecenters (TCRA, 2011). Accordingly, it is required that every licensed telecommunication service provider extend services to cover rural areas. In turn, the Universal Communications Services Act of 2006 provides for special concessions to service providers in this sector. The creation of the TCRA, in combination with the Communications Act of 1993 and the National Telecommunications Policy launched in 1997, began a new era for the communications sector in Tanzania, making telecommunications “one of the most liberalized sectors of the economy” (Materu-Behitsa, Diyamett, 2010).

Nevertheless, an ICT Benchmarking Report for the EAC (2009) identified various challenges for this effort, including, “ownership of the process; institutional and governance structure; capacity and coordination among ministries; and competition for resources among ministries, departments and agencies” (Hashim, 2011). The lack of harmonization among ICT related policies has led to the adoption of different systems and standards resulting in an unnecessary duplication of effort, wasting already scarce national resources and further hindering national development and global presence (Materu-Behitsa, Diyamett, 2010).

Information and Communication Technologies

While there are no subscription fees for neither radio nor television programs, radio broadcasting is more accessible than television (Materu-Behitsa, Diyamett, 2010), likely due to poor electrical access. Radio penetration in rural areas can be limited by weak reception (Materu-Behitsa, Diyamett, 2010). Most of the radio and TV stations with regional or district coverage are privately owned and operated with smaller capital investments. In 2010 the TCRA reported 70 radio stations and 26 television stations (Table 6, Appendix A). Radio Maria, Tanzanian Broadcasting Corporation, and Radio Free Africa have been confirmed as transmitting agricultural information (Mato, personal communication, January 2013). Public buses typically feature televisions with videotape and DVD capacity¹; these are typically utilized to show recordings of television broadcasts from Kenya.

Due to efforts to nationalize the communications networks, foreigners are not permitted to run media institutions. Foreign investment in any media outlet may not exceed 49%. Foreigners can only be employed as technical experts and only when such expertise is not locally available. (Materu-Behitsa, Diyamett, 2010). There is currently no national manufacturer of ICT equipment in Tanzania (Materu-Behitsa, Diyamett, 2010).

¹ Personal communication, Heather Cruise (UC Davis, 1/9/2013)

Currently there are two national fixed-line operators, TTCL and Zantel. In January 2012, there were approximately 161,000 fixed-line subscribers, compared to about 28 million mobile phone subscribers (Table 5, Appendix A) [TCRA 2012]. This may be due to the fact that landlines are subscription-based, while cell phones do not require payment to maintain a connection when services are not in use (Molony, 2008), but the very high cost of fixed lines is also an issue².

Mobile telephone services were introduced in 1995. The market shares of the four major mobile operators are: Vodacom (44%), Airtel (27%), Tigo (20%), and Zantel (8%). As of June 2012 there were 28 million SIM subscribers (TCRA, 2012) (Tables 4 and 6, Appendix A). The mobile sector contributed more than 99% of all voice subscriptions in 2012 (TCRA 2012); the majority of mobile services are prepaid (Gillwald & Stork, 2008). Mobile phone use in Tanzania is relatively costly due to heavy taxation of communications equipment and services; Nokia calculates the total-cost-of-ownership for mobile phones in Tanzania as just below the global average of 44.18 USD per month, as contrasted with 25.30 USD per month in Kenya (Materu-Behitsa, Diyamett, 2010).

It was estimated that by June 2010 only 11% of Tanzanians had accessed the Internet. Of that, 5% of access came from Internet cafes, 55% from organizations/institutions, and 40% from households. (Tables 4, 5, and 6, Appendix A) The percentage of mobile subscriptions with broadband access in 2011 was about 2% (iHub, 2012). Due to the high cost of personal computers and Internet-enabled devices, ownership of these instruments is rare. With respect to Internet providers, the Tanzania Communications Commission licenses companies to provide public data communication services including Internet bandwidth (Table 8, Appendix A). Data operators are independently responsible for securing their connection. There is no national Internet Exchange Point; rather, Tanzania's local traffic is routed internationally. (Materu-Behitsa, Diyamett, 2010) According to TCRA (2010), the total Internet and data capacity of Tanzania is 3,459Mbps, of which 43% is from satellite and 57% is fiber optic. Of this total capacity, only 65% was in use as of June 2010 (TCRA 2010). In 2006 Tanzania established the Universal Communications Access Fund to finance rural telecommunications. They are expecting to build about 3000 telecenters in underserved areas, although unreliable electricity and the high cost of internet remain significant obstacles (Matarubukwa, 2011). Internet access in telecenters is achieved via VSAT or broadband, both of which remain challenging in terms of cost and connectivity³.

The Present ICT Situation

The Government of Tanzania is determined to integrate ICT in all aspects of socio-economic activities and recognizes that joint and deliberate efforts by various stakeholders are imperative (Yonazi, 2009). Thus, current efforts using ICTs for agricultural extension in

² Personal communication, Andrea Bohn (University of Illinois, 1/8/2013)

³ Personal communication, Naomi Maselle (Office Manager Tanzania Telecenter Network and director of CROMABU telecenter, 1/10/2013)

the country are found in the public sector, NGOs, for-profit organizations and donor-funded projects (See Appendix C for a description of current ICT agricultural extension initiatives in Tanzania).

As exemplified in Table 1 below, the most frequently employed technologies in these initiatives include cellphones, Internet, and radio; many initiatives use a combination of these. Cellphones are widely used to deliver market information (initiatives mentioned in Appendix D) but promising initiatives have explored other uses, including specific agricultural information, pest and disease alerts, remote livestock disease diagnosis, and sharing of pictures and videos. As the most widely accessible ICT to rural farmers, radios have thus far been the most successful technologic enhancement of agricultural extension. Local radio programs are playing host to various initiatives to engage farmers with each other and extension agents to improve agricultural productivity. While Internet is still widely unavailable to rural farmers, it is becoming increasingly important in delivering information to extension agents and agricultural experts working with farmers. TV is the least used - almost absent- tool in agricultural extension.

Table 1: Summary of Initiatives by ICT Used

ICT	Example Initiatives
Radio	Farmer Voice Radio Rice Regional Centre of Excellence
Call Center	Tigo-Kilimo
Cell phone	Health for Animals and Livelihood Improvement <i>Sauti ya wakulima</i> , "The voice of the farmers" mAgri/mfarmer Rice Regional Centre of Excellence
TV	Rice Regional Centre of Excellence
Internet	Crop Protection Compendium Rice Regional Centre of Excellence Community Knowledge Centre <i>Sauti ya wakulima</i> , "The voice of the farmers" ALIN Maarifa ("knowledge") Centers

Although the use of ICTs tools is quite promising in Tanzania, there are diverse challenges to overcome. Among the challenges identified in the report "ICT4D: Facing the challenges head-on in Tanzania" by Yonazi (2009) are the unsupportive ICT connectivity and supporting infrastructure (roads and electricity), inadequate quality of ICT content, limited ICT skills, and limited awareness of ICT benefits. In Tanzania, other specific challenges faced by current efforts include language barriers, literacy, project sustainability, and the high cost of the technologies. A complete list of identified challenges and potential strategies to consider in their resolution are explored in Table 10, Appendix A.

Apparently Promising Options

We believe the most promising initiatives that a grantee might consider including in their extension proposal are those capable of being extended beyond what they are being used for today. Such an approach will take advantage of existing networks, relationships, and experiences to fulfill unmet needs. Furthermore, ICT approaches likely to be successful should consider strategies to overcome current challenges faced by farmers in the country. Approaches with a combination of various ICT tools and direct communication may often be the right fit. Strategies that permit interaction and a direct exchange of personalized information with individual users as well as between multiple parties (i.e., organization to farmer, farmer to organization, and farmer to farmer) are more impactful than a one-way (i.e., organization to farmer) provision of general prescriptive information.

Experts in-country⁴ have confirmed that given the limited accessibility of the internet for Tanzanian farmers, local radio programs have been and for some time will continue to be the most successful form of ICT to reach farmers. Nevertheless, this option is not as low cost as might be assumed⁵. This augmented costs is partially due to the fact that national radios—which reach the most listeners for the lowest cost—principally reach urban dwellers (RLDC, 2009), and cannot provide region-specific information. This necessitates the utilization of various local radio stations in rural areas to provide adequate reception, sufficiently region-specific agricultural information, and trained staff.

The rapidly increasing popularity of cellular phones give cell phone networks and agricultural extension call centers growing potential, both independently and in tandem with other initiatives, such as radio programs. Both cell phones and radio offer the farmer the ability to receive extension information without leaving their responsibilities at home. Because electricity is largely unavailable in rural areas, *dukas*, or cell phone charging stations, are frequented by a diverse audience of locals and may be a potential point of extension contact. As mentioned in the previous section, promising initiatives using cellphones explore uses that go beyond delivery of market information, such as SMS and voice message delivery of specific agricultural information and pest and disease alerts, remote livestock disease diagnosis, and farmers' networks sharing pictures and videos of agricultural practices. Farmers will need training to fully employ the cell phone extension service tool, since currently cell phones are mainly used only for personal use⁶.

⁴Personal communications with Richard Bruno (African Institute for Capacity Development, 12/26/2012); Dr. Janet Kaaya (Division of Research and Development, Ministry of Agriculture, Food Security and Cooperatives, 01/02/2013); Kees Vog (Winrock International, 01/06/2013); Dr. Sultan H. Jaribi (CAHNET Tanzania, 01/04/2013); Fr. Nestor Mtweve (Njombe Development Office 01/05/2013); Naomi Maselle, (Office Manager Tanzania Telecenter Network and director of CROMABU telecenter, 1/10/2013); Marcely Madubi (Winrock International, 1/10/2013)

⁵ Dr. Janet Kaaya (Division of Research and Development, Ministry of Agriculture, Food Security and Cooperatives, 01/02/2013)

⁶ Marcelo Madubi (Winrock International, 1/10/2013)

Mobile cinema, which has proved to easily engage villagers by overcoming language and literacy barriers⁷, has been well received in a conservation context, thus holding potential to be extended into the agricultural outreach sector as well. Currently, mobile cinema in Tanzania consists of vans provided with a generator to run a video or DVD projector on a screen to show films out-door (Development Associates Ltd., 2004) and in-door (usually, schools and churches)⁸. There is even the possibility to use a bicycle-powered generator, overcoming the challenge of electricity access or battery requirements. The great advantage of using mobile cinema, or even to a lower scale audio visual content shared with farmers' groups via CD, is that people can actually see and therefore are more likely to actively look and learn about the specific topics and practices shown⁹.

Finally, Internet, while still generally inaccessible to rural farmers, is an important informational reference for extension agents and agricultural experts working through agricultural radio programs, call centers, and in the field. In this sense, rural communication centers (RCAs) appear to be promising, especially when intermediaries can help to overcome barriers of illiteracy and lack of computer skills. RCAs are meeting points to reach a broad audience, offer multiple types of information, and assess local needs. In addition, the Tanzanian government, through the Tanzania Communication Regulatory Authority (TCRA), has committed to support improvement of telecenters' performance and sustainability as a strategy to improve livelihood of rural people (TCRA, BIID and TTN, 2011). Currently, telecenters in Tanzania face poor capacity service, low skilled staff, limited technology (both in terms internet access and hardware), and limited access to electricity (TCRA, BIID and TTN, 2011), in addition to sustainability, since most telecenters started as "pilot projects" and struggle to sustain after the projects end¹⁰. This has resulted in having very few active telecenters in rural areas due to the high cost of Internet access and electricity or power generators¹¹.

See Table 2 below for a complete list of the most promising ICT approaches with technology resources currently available in-country and how they may be used in agricultural extension. Further examples and in-depth profiles of the same are given in Appendix C.

Tables 2: Most Promising ICT Approaches (in order of degree of likely success)

Radio Programs	
Current Use	<ul style="list-style-type: none"> - Various extension initiatives (agriculture, health, education, etc) - National and local/community radios
Alternative	Local and permanent agricultural programs

⁷ Richard Bruno (African Institute for Capacity Development, 12/26/2012)

⁸ Richard Bruno (African Institute for Capacity Development, 12/26/2012)

⁹ Naomi Maselle, (Office Manager Tanzania Telecenter Network and director of CROMABU telecenter, 1/10/2013)

¹⁰ Naomi Maselle, (Office Manager Tanzania Telecenter Network and director of CROMABU telecenter, 1/10/2013)

¹¹ Naomi Maselle, (Office Manager Tanzania Telecenter Network and director of CROMABU telecenter, 1/10/2013)

Application	
Why Promising	<ul style="list-style-type: none"> - Reaches people at home and in groups (community listening) - Overcomes electricity issues via battery operation - Overcomes illiteracy. - Takes advantage of existing networks.
Framing Conditions	Trustworthy source of information, locally relevant, sustainable.
Example	Farmer Voice Radio (FVR)

Cell Phone Networks	
Current Use	Principally market information, automated alerts, and pollsters.
Alternative Application	Pest/disease alerts and spread mapping, remote troubleshooting/diagnosis, sharing pictures and videos of good practices, personalized extension support.
Why Promising	<ul style="list-style-type: none"> - Intermediaries generally have sustainable business models - Reaches people at home - Networks already exist. - Reaches beyond individual user when message spread through “word of mouth” or when users are representatives of farmers’ groups. - Offers use for both literate (SMS) and illiterate (voice message, pictures, videos) users
Framing Conditions	Trustworthy source, available charging stations, could use intermediaries when necessary (to overcome illiteracy when text messaging is used).
Example	CAHNET, HALI project, GLCI project, Esoko, FrontlineSMS.

Call Centers/ Farm Help Lines	
Current Use	Personalized agricultural extension
Alternative Application	Expansion of the same
Why Promising	Opportunity to provide timely and relevant information; track diseases/pest outbreaks.
Framing Conditions	Trustworthy source, Locally relevant (universities, research centers), good promotion to make farmers aware of the service, affordability
Example	Tigo-Kilimo

Mobile Cinema	
Current Use	Environmental education
Alternative Application	Agricultural extension

Why Promising	Overcomes illiteracy barrier, novel resource, easy to engage farmers.
Framing Conditions	Trustworthy source, locally relevant.
Example	Maajabu Mobile Cinema ¹² , Electric Pedals ¹³ , Friends of Ruaha Society ¹⁴
Rural Communication Centers	
Current Use	To access the internet via computers installed at the center. Computer literacy, market information
Alternative Application	Charging phones, agricultural information, communication channel with authorities (report current problems and pest/diseases outbreaks).
Why Promising	Provides access to broad sources of agricultural information and meeting point for farmers.
Framing Conditions	Trustworthy source, locally relevant, reliable electricity source, use intermediaries to overcome literacy barriers.
Example	ALIN Maarifa centers, IICD RCAs, Community Knowledge Centre

Key Stakeholders

As emphasized by the Tanzanian government, joint and deliberate efforts by various players are imperative to successfully integrate ICT in socio-economic activities (Yonazi, 2009). Partnership for projects is critical and should involve a variety of actors, such as public extension and research services, community-based organizations, NGOs, farmer associations, existing ICTs initiatives, as well as private companies, in order to take advantage of existing networks and trust on public and government institutions¹⁵. This also helps in understanding the variegated needs and problems of the target audience, which is composed of farmers of varying economic levels, education levels, geoclimatic regions, and production foci^{16, 17}.

¹² By the Tanzania Natural Resource Forum. Between 2005-2009, the film show unit visited 6 regions and showed environmental films to over 50,000 people. The equipment includes a video projector, a screen, a clear sound system and a generator. <http://www.tnrf.org>. Accessed January 9, 2013.

¹³ Conservation initiative with pedal powered field cinemas providing environmental education to support the Udzungwa Forest Project (UFP). <http://electricpedals.com/2011/07/19/news-flash-from-tanzania/>. Accessed January 9, 2013.

¹⁴ Environmental Education, Educational Film Shows reaching 10,000 villagers in 2008. <http://www.friendsofruaha.org/home.html> Accessed January 4, 2013.

¹⁵ Janet Kayaa, (Division of Research and Development, Ministry of Agriculture, Food Security, and Cooperatives, 01/02/2013 and 1/10/2013, resp.)

¹⁶ Richard Bruno (African Institute for Capacity Development, 12/26/2012)

¹⁷ Sultan Hussain Jaribi (CAHNET, 01/03/2013)

Numerous potentially important actors are currently participating in the agricultural extension enhancement through ICT in Tanzania. These stakeholders fill a variety of roles. Service providers, such as Esoko, Magpi, and Freedom Fone, offer customizable software and communication platforms to connect agricultural specialists to farmers. Information providers, including Farm Radio International, Infonet, and the Community Animal Health Network, provide expertise on issues confronted by farmers. Finally, donors and NGOs provide essential funding, monitoring and evaluation, and coordinative efforts to connect providers. These actors cover the spectrum of technologic options, and in many cases have combined various technologies to better meet the communication needs and preferences of their users. At the same time, there is significant overlap and repetition in the services they provide; determination of which would be most successful as part of a new development initiative may largely depend on their ability to expand and adapt their current functions to address as-yet unmet needs. A list of the most promising and pertinent stakeholders according to their principle function with respect to agricultural ICT initiatives in Tanzania has been provided in Appendix E, along with in-depth profiles for select stakeholders. Current promising projects and initiatives supported by stakeholders listed here are described in Appendix C.

Appendix A: Additional Tables and Figures

Table 3: Internet Subscribers by subscription type:

	2008	2010
Internet Cafes	350	723
Organizations/Institutions	3,055	3,329
Household/Individuals	248,433	483,204
Total	251,838	487,256

Source: (TCRA, 2010)

Table 4: Internet Subscribers by access type:

	2008	2010
Cable Subscribers	589	594
Fixed Wireless Subscribers	2,585	3,150
Mobile Wireless Subscribers	232,302	462,514
VSAT Subscribers	1,252	1,254
Fibre-to-home	0	0
Other Broadband Subscribers	15,110	19,744
Total	251,383	487,256

Source: (TCRA, 2010)

Table 5: Internet users by subscription type:

	2008	2010
Internet Cafes	126,000	260,280
Organizations/Institutions	2,444,000	2,663,200
Household/Individuals	993,732	1,932,816
Total	3,563,732	4,856,296

Source: (TCRA, 2010)

Table 6: Sector Overview

Access	2005	2010
Fixed-telephone subscriptions (per 100 people)	0.4	0.4
Mobile-cellular telephone subscriptions (per 100 people)	7.6	46.8
Fixed (wired)-broadband subscriptions (per 100 people)	0.00	0.01
Households with a computer (%)	2.1*	2.6*
Households with Internet access at home (%)	0.5*	0.7*
Usage		
Int'l. voice traffic, total (minutes/subscription/month)	3.1	1.2
Domestic mobile traffic (minutes/subscription/month)	7.1	56.7
Individuals using the Internet (%)	4.3*	11.0
Quality		
Population covered by a mobile-cellular network (%)	45	85
Fixed (wired)-broadband subscriptions (% of total Internet)	1.6	0.6
International Internet bandwidth (bit/s per Internet user)	60*	701
Affordability		
Fixed-telephone sub-basket (\$ a month)	..	8.8
Mobile cellular sub-basket (\$ a month)	..	9.7
Fixed-broadband sub-basket (\$ a month)	..	20.8
Trade		
ICT goods exports (% of total goods exports)	0.3	0.4
ICT goods imports (% of total goods imports)	5.8	3.8
ICT service exports (% of total service exports)	2.7	2.1
Applications		
E-government Web measure index (0–1, 1=highest presence)	0.29	0.35
Secure Internet servers (per million people)	0.1	0.5

* ITU estimation

Source: 2012 The International Bank for Reconstruction and Development/The World Bank

Table 7: Sector Market Overview

Telephone and Internet Operators:	2006	2010
Fixed Line Operators	2	2
Mobile Operators	5	10
Data Operators and Internet Service Providers	25	80
Number of Television Stations:		
National Television Stations	6	5
Regional Television Stations	2	1
District Television Stations	22	20
Total	29	26
Number of Radio Stations:		
National Radio Stations	5	6
Regional Radio Stations	8	18
District Radio Stations	31	43
Community Radio Stations	2	3
Total	46	70

Source: URT 2011

Table 8: Tanzania - Basic Socio-Economic Facts 2012

Category	Fact
Population	46,912,768
Population growth	2.85%
Religions:	Mainland: Muslim - 35%, Traditional beliefs - 35%, Christian - 30%. Zanzibar: Muslim 99%
Literacy	69.4% of the population (Male: 77.5%; Female: 62.2%) (2002 Census CIA)
GDP (PPP)	\$67.9 billion (2011 est.)
GDP Per Capita (PPP)	\$1,600
Labor force	24.06 Million
GDP (Composition by sector)	Agriculture (27.8%), Industry (24.2%), Service (48.%) (2011 est.)

Source: CIA (2012)

Table 9. Challenges in the use of ICTs and strategies to consider in future initiatives.

Current challenges	Strategies to consider
Language barriers - wide language diversity of native tongues	<ul style="list-style-type: none"> • Provision of content in Kiswahili¹⁸, together with the rise in literacy in the current population (around 70%; CIA, 2012), (Yonazi, 2009).
Literacy	<ul style="list-style-type: none"> • Voice messaging through cell phones¹⁹ • Favor graphics, photos, and videos over text
Lower access to technology by women compared to man ²⁰	<ul style="list-style-type: none"> • Consider a gender-based perspective, using technologies that can be easily accessed by women, such as radio. • Consider forming groups of women that can support and share information with each other.
Computer/ technology literacy	<ul style="list-style-type: none"> • Consider an intermediary approach to assist end users. • Train users on basic computer skills. Consider different uses of computers depending on the user. For example: extension agents are able to access and understand complex websites, while farmers would benefit more when accessing pictures and videos.
Networking between projects	<ul style="list-style-type: none"> • Build on existing/previous efforts to take advantage of users' knowledge and experience. • Training is most successful in person²¹. Working in groups and using current networks will make this process more cost effective.
Project sustainability ²²	<ul style="list-style-type: none"> • Commit user to share part of the cost. For example, if information provided via SMS is relevant and useful, farmers will pay to receive those messages²³. • Consider other services that use ICTs to sustain the project. For example, ALIN telecenters use money transfer service fees to offset costs. Revenue may also be generated through sponsorship/ advertising but bears the risk that the IC channel is perceived as biased towards those companies. • Make audience aware of the available services²⁴.

¹⁸ Richard Bruno. African Institute for Capacity Development. Personal communication 12/26/2012; Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013; David Wolking. One Health Institute - Wildlife Health Center University of California, Davis. Personal communication 01/04/2013.

¹⁹ Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013

²⁰ Marcely Madubi (Winrock International, 01/11/2013) e-mail communication.

²¹ Dr. Sultan H. Jaribi (CAHNET, 1/3/2013) personal communication

²² Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013

²³ Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013

Trustworthiness, credibility, and relevance of information	<ul style="list-style-type: none"> ● Provide needs-driven information. ● Use current sources of information preferred by farmers. ● Work with agricultural research centers, extension agents, and universities (Sokoine and others)²⁵. ● Consider agricultural practices that use locally available resources, financing sources, markets²⁶, and products. ● Recognize and target diverse²⁷ audience groups²⁸. ● Provide a clear message, especially when using SMS²⁹.
Electricity access and reliability ³⁰	<ul style="list-style-type: none"> ● Consider alternative energy options (solar, indiGo, motor bike transformers) ● Link with telecenters, rural communication centers, dukas (shops that provide cell phone charging service, phone cards, and groceries).
Internet access (cost, low bandwidth) ³¹	<ul style="list-style-type: none"> ● Consider promoting internet access for intermediary approach rather than trying to reach end users.
Cell phone coverage/technology reliability ³²	<ul style="list-style-type: none"> ● Consider the use of “lower” technology hardware and software that is more reliable or more easily repaired
Lack of access to market information	<ul style="list-style-type: none"> ● Consider existing services provided on market prices and market intelligence information. ● Consider providing agricultural information and market information.

²⁴ Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013

²⁵ Dr. Janet Kaaya. Division of Research & Development Ministry of Agriculture Food Security & Cooperatives. Personal communication 01/02/2013; Dr. Sultan H. Jaribi. CAHNET Tanzania. Personal communication 01/03/2013; David Wolking. One Health Institute - Wildlife Health Center University of California, Davis. Personal communication 01/04/2013; Marsely Madubi, Winrock International. Personal communication 01/10/2013.

²⁶ David Wolking. One Health Institute - Wildlife Health Center University of California, Davis. Personal communication 01/04/2013; Dr. Sultan H. Jaribi. CAHNET Tanzania. Personal communication 01/03/2013.

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²⁸ Fr. Nestor Mtweve, Njombe Development Office. Personal communication 01/05/2013; Kees Vogt, Winrock International. Personal communication 01/06/2013.

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³¹ Fr. Nestor Mtweve, Njombe Development Office. Personal communication 01/05/2013; Kees Vogt, Winrock International. Personal communication 01/06/2013.

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³³ Phone call communication, except email where indicated.

Appendix C: Current Promising ICT Initiatives in Tanzania

Community Knowledge Centre (CKC) project from World Vision Tanzania (WVT), http://beta.wvi.org/tanzania			Status: Ongoing
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Internet		King'ori Area development Programme of World Vision Tanzania (Donor) (Ms Karen Schick and Jurgen Hinderer from Germany)	Donor-funded
Services offered	End-users	Intermediary Y/N	How it works
- Provision of timely information on farming, weather, crop prices and market in general. - Free internet services, library facilities and secretarial amenities	17 Villages in Meru district, in the first stage of the project.	Y (Center staff when needed)	Community Knowledge Centres (CKC) are established in remote parts of the country and provide access to information services. CKC are provided with a set of computers connect to the internet to which farmers can access for free.
Contact Information		References, articles	Comments
Tim Andrews WVT National Director P.O. Box 6070, Arusha, Tanzania Tel: +255 27 549252/58 Fax: +255 27 2549259		Tanzania Daily News (Dar es Salaam) Article "Tanzania: World Vision Takes ICT to Villages" By Marc Nkwame, 24 February 2012. http://allafrica.com/stories/201202240914.html	It started in 2012 with the first center in the King'ori village, Meru district. More centers to be established.

Crop Protection Compendium, www.cabi.org			Ongoing
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Multimedia tool		- CABI International, including the support from more than 50 organization around the world.	Donor-funded
Services offered	End-users	Intermediary Y/N	How it Works
- Software used to identify disease and pests - Printouts of pest/disease information in local languages.	Local Farmers Extension agen	Yes; extension agents	CPC is created by CAB international and is used worldwide by crop protection specialists, extension workers, quarantine officers, plant breeders and policy makers, as well as farmers.
Contact Information		References, articles	Comments
support@cabi.org compend@cabi.org		http://ictupdate.cta.int/en/Feature-Articles/The-CPC-a-multimedia-tool-to-identify-pests/%2869%29/1051279925	It looks like a great tool for extension people to use to identify the disease or pest. Project still continues and is also available on the web.

Health for Animals and Livelihood Improvement (HALI) –Surveillance and prevention of zoonotic diseases in livestock, http://haliproject.wordpress.com/			Status: To be implement in June 2013
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Cellphone	Cellphone company provider	<ul style="list-style-type: none"> - Livestock climate change CRSP “Adapting livestock systems to climate change”. Colorado State University (Donor) - Friends of Ruaha Society (FORS) (Donor). - Wildlife Health Center and Executive Director of the One Health Institute, School of Veterinary Medicine, University of California, Davis (Partner) - Faculty of Veterinary Medicine and Public Health. Sokoine University of Agriculture, Tanzania (Partner) - District Veterinary office and Livestock Extension Agents. - National Parks (Partner) - Veterinary Investigation Centers of Tanzania (Partner) - Village executive officers (Partner) - Pastoral leaders’ councils (Partner) 	The program Livestock change CRSP provided a seed grant. Users (pastoralists) will pay for the phone calls made and text messages received.
Services offered	End-users	Intermediary Y/N	How it works
<ul style="list-style-type: none"> - Remote disease diagnostic system (automatic) - Livestock and human health information - Disease monitoring surveillance 	Pastoralists; 160 “households” during the pilot phase. It is expected to include villagers in the future.	N	1.5 year-long pilot phase to start in June 2013 in the Ruaha ecosystem. HALI will provide pastoralist “households” with cellphones. If they see a sick animal, they can call and access to the automatic remote disease diagnostic system. The remote system follows a “diagnostic tree” developed by UCD. The software was developed by SUA.
Contact Information		References, articles	Comments

Health for Animals and Livelihood Improvement (HALI) –Surveillance and prevention of zoonotic diseases in livestock , http://haliproject.wordpress.com/		Status: To be implement in June 2013
David J. Wolking One Health Institute - Wildlife Health Center University of California, Davis Phone: +1 415 690 9955; +1 530 341 3507 Skype: djwolking; Email: djwolk@gmail.com	Personal communication 01/04/2013	- The system works in Swahili that pastoralists can understand, but their primary tongues are different.

Sauti ya wakulima ("The voice of the farmers" in Kiswahili), http://sautiyawakulima.net			Status: Ongoing
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
<ul style="list-style-type: none"> - Cellphone (GPS, images and voice recording). - Internet (3G, to distribute information) 		<ul style="list-style-type: none"> - The North-South Center, Swiss Federal Institute of Technology - Zurich (ETHZ) (Donor) - Extension Officer (Coordinator) - The Department of Botany, University of Dar es Salaam (UDSM) (Scientific support) - Z-Node: The Zurich Node of the Planetary Collegium. Institute of Cultural Studies, University of Applied Arts, Zurich (Scientific support) 	grant-based
Services offered	End-users	Intermediary Y/N	How it works
- Audiovisual material of agricultural practices, observations regarding changes in climate and related issues, and farmers' interviews.	Farmers, number unknown/unreported	Yes, the core group (5 women and 5 men)	<p>This is a collaborative knowledge base created by farmers from the Chambezi region of the Bagamoyo District in Tanzania. Farmers use smartphones to gather audiovisual material, using the open source application "OjoVoz". Images and voice recordings are then published on the Internet.</p> <p>Five men and five women meet weekly at the agricultural station in Chambezi to view and listen to the posts from the previous week. Two</p>

Sauti ya wakulima ("The voice of the farmers" in Kiswahili), http://sautiyawakulima.net			Status: Ongoing
			<p>smartphones are passed on to other participants, as shared tools for communication. The smartphones are equipped with GPS modules and an application that makes it easy to send pictures and sounds to the Internet.</p> <p>Farmers hope that, by communicating their observations to extension officers and scientific researchers, they can participate in the design of new strategies for adaptation.</p>
Contact Information		References, articles	Comments
<p>Project founder: Eugenio Tisselli, Email: cubo23@yahoo.com</p> <p>Contact form on website: www.sautiyawakulima.net/research/contact/</p> <p>Facebook: https://www.facebook.com/sautiyawakulima</p>		<p>Website: http://sautiyawakulima.net/bagamoyo/about.php?l=1</p> <p>Blog: www.sautiyawakulima.net/research/</p>	<p>- The project was also present in the Kinondoni district but it stopped due lack of funding.</p> <p>- The project idea is based on the "Megafone Project", an initiative started in 2003 in several parts of the world. This project would invite groups of people to express their experiences and opinions through face-to-face meetings and mobile phones for audiovisual material. The phones would act as "digital megaphones" (from http://megafone.net)</p>

Tigo Kilimo			Status: Ongoing
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- SMS	<ul style="list-style-type: none"> - Tigo Tanzania (mobile phone operator) - Nuru Infocomm (Application Services Provider: currently provide high speed fibre access on 	<ul style="list-style-type: none"> - TechnoServe - GSM Association - Government, university, nonprofit and private partners including: Tanzania Meteorological Association (government); Sokoine University; Rural Urban Development Initiatives (non 	<p>Delivers real-time information on weather and farming tips via SMS.</p> <p>Partners provide information, connections to smallholder farmers and revenue streams</p>

	Seacom and last mile solutions, SMS applications services for Premium SMS, and applications using mobile communications technology)	profit).	such as advertising that can make the product sustainable.
Services offered	End-users? (Type and estimated number)	Intermediary Y/N ?	Other Notes
- Real-time info on market prices, weather forecast and agronomy tips on crops via SMS	Piloted the first version of the product, a text-messaging service, in June 2012 with only 200 farmers. This limited version went “viral” and reached more 10,000 people in less than two months. The full version was launched in November 2012 to deliver information to a target goal of 500,000 smallholder farmers in Tanzania.	No	Farmers can access the service by dialing *148*14#
Contact Information	URL	References, articles	Comments
- TechnoServe International Headquarters Washington, DC (202) 785-4515 technoserve@tns.org		http://www.gsma.com/mobilefordevelopment/interview-with-tigo-tanzania-on-launching-an-agri-vas/ http://www.technoserve.org/blog/a-growing-lifeline-mobile-technologies-in-agricultural-development#.UOR2Nonjmz5 An article about lessons learned from the pilot:	Technoserve seeks to develop financing models where the costs and rewards are shared among partners at all stages of the value chain, thus building the commercial case for these

- Yaya Ndjore is Project manager for Tigo Kilimo service at Tigo Tanzania.		http://www.gsma.com/mobilefordevelopment/tigo-and-technoserve-pilot-tigo-kilimo-service-first-lessons-learned	mobile solutions to ensure they can be offered in the future without support from donors and development catalysts.
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mAgri/mfarmer, www.gsma.com/mobilefordevelopment/programmes/magri/mfarmer-initiative			on-going in other countries/ to be implemented in Tanzania
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- mobile		- GSMA - Bill & Melinda Gates Foundation - USAID	To date, focus has been on engagement with mobile operators and their partners to prove the market opportunity of agricultural extension services through mobile to smallholder farmers and to understand which business models are most suitable.
Services offered	End-users	Intermediary Y/N	How it works
- Provides support to mobile service providers, in partnership with public and private sector agriculture organizations, to facilitate the creation of scalable, replicable and commercially sustainable agricultural information services.	2 pilot projects in India and Kenya, benefitting over 1.5 million farmers in the two countries.	Yes, mAgri is an umbrella organization that partners to provide funding and guidance to local ITC mobile projects.	The GSMA Mobile for Development accelerates economic, environmental and social evolution through mobile technology. Within the Mobile for Development, the mAgri Programme exists to catalyse the deployment of mobile solutions benefiting the agriculture sector.
Contact Information		References, articles	Comments
magri@gsm.org mFarmer@gsm.org			Conducted under USAID. Very throughout reports and information about technical service design, marketing, and commercial business models. Definitely a good starting reference for

		any players.
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Farmer Voice Radio, www.farmervoice.org			In Tanzania since 2011, after success in Kenya and Malawi projects (began in 2010)
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
<ul style="list-style-type: none"> radio cell phone 	none	Donors: <ul style="list-style-type: none"> Bill and Melinda Gates Foundation American Institutes for Research participating partners: <ul style="list-style-type: none"> Kilosa Community radio, Kilosa Radio Uzima , Dodoma Ruangwa community radio, Ruangw BomaHai Community radio, Moshi Mahenge Community radio, Mahenge Radio Maria - Dar es salaam SUA TV Habari Maalum TAFRI National and Local Agricultural Radio Advisory Committees government 	<p>Funded via grants plus trade agreements; intention of the trade agreements within the consortium is to eventually become self-sustaining.</p> <p>The consortium permits function without direct operational funding, on the basis that each partner contributes and receives benefits. For example, cooperating radio stations have committed more than 6,900 hours per year of free airtime, while governmental or farmer associations have assigned extension officers to work with FVR at no cost.</p>
Services offered	End-users	Intermediary Y/N	How it works
- Online agricultural extension audio organized by crop - Radio-based ag extension	Six radio stations in Tanzania, as well as several in neighboring	Yes; Farmer Voice organizes enabling partners, including government extension agents, an advisory committee, and radio stations, to make this service available.	National and Local Agricultural Radio Advisory Committees produce quarterly production agendas for each station. FarmerVoice specifically states their focus on

Farmer Voice Radio, www.farmervoice.org		In Tanzania since 2011, after success in Kenya and Malawi projects (began in 2010)	
with gender integration focus - Listener feedback system - Listeners club organization - Star programming (through which individual and small groups of farmers get individualized support or provide information regarding their experiences and innovations to others) - In-house research desk - Automated support, such as localized weather forecasts and focused agricultural information, in 7 languages.	countries that are likely heard in Tanzania.		farmer involvement at all levels, gender integration, and a consortium of sustainable partners, as well as a structured feedback system and specific, actionable messages delivered to farmers.
Contact Information		References, articles	Comments
<p>Email communication Dec 22, 2012 with: Dr. Siza D. Tumbo, PhD Professor in Agricultural Engineering, Modeling and Automation. Dept. of Agricultural Engineering & Land Planning, Sokoine University of Agriculture P.O. Box 3003 Morogoro, Tanzania Emails: siza.tumbo@suanet.ac.tz; siza.tumbo@gmail.com</p> <p>And: Camilius Sanga <csanga@gmail.com> Sokoine University of Agriculture P.O.Box 3218,Chuo Kikuu, Morogoro Tanzania http://www.suanet.ac.tz</p>			This project seems to be truly effective in conveying information that improves productivity, nutritional security, and variety of crops produced and getting farmers involved in a network through which innovation is communicated.

ALIN Maarifa (Knowledge) centers initiative, http://alin.net			Status: On-going
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Internet	- Safaricom Limited	- Arid Lands Information Network (ALIN) - Natural Forest Resource Management and Agro Forestry Centre (NAFRAC) for the Maarifa center in Shinyanga, Tanzania. - Tanzania Traditional Energy and Development Organization (TaTEDO)	The field officer managing each center is employed and trained by ALIN. Under ALIN's support, local group members formed steering committees initiating income generation activities for the centres sustainability, such as money transfer and transaction services with M-PESA agency.
Services offered	End-users	Intermediary Y/N	How it works
- Internet connectivity - ICT training - Technical Information - Capturing and documenting agricultural practices from the field, with podcasting equipment, cameras and camcorders.	- Local communities; in 2 centers in Tanzania with unknown/unreported number of individual users.	Y (The Community Knowledge Facilitator (CKF) and focal groups, as a point of entry and to support both dissemination and capture of information about innovations and best practices from communities)	Maarifa centers (a room or a modified shipping container) have at least five computers connected to broadband internet either through a GSM router or VSAT. Information is tailored to community needs although it usually focuses on best practices in agriculture and livestock, among others. A volunteer Community Knowledge Facilitator from the local community in each center ensures that barriers to information are overcome (illiteracy, language and lack of basic ICT skills). ALIN supports the formation of information nodes -the <i>focal groups</i> - to enhance community involvement. These are managed by an advisory group made of <i>informediaries</i> (mainly extension workers), farmers, ALIN's field officer (convener) and representatives of youth and people with disabilities.
Contact Information		References, articles	Comments
Regional Office, AAYMCA Building State House Crescent off State House Avenue		"About us" and "Maarifa Centers" on website http://alin.net/	Two centers in Tanzania, located in Dodoma and Shinyanga. Relevant to reach remote regions. It is

PO Box 10098 - 00100 Nairobi, KENYA Telephone: +254 (20) 2731557 Telefax: +254 (20) 2737813 Email info@alin.net		unclear how competent volunteers are retained.
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Rice Regional Centre of Excellence			To be implemented
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
<ul style="list-style-type: none"> - TV - Cinema shows (videos) - Radio - Mobile phone - Internet (web, email, YouTube, Vimeo, tele/video conference, blog, D-groups, Google docs, wikis, Web 2.0 tools) 		<ul style="list-style-type: none"> - Rice Regional Centre of Excellence (RRCoE) - Eastern African Agricultural Productivity Programme (EAAPP) - Ministry of Agriculture Food Security and Cooperatives (MAFC) of Tanzania 	public funding and grant-based
Services offered	End-users	Intermediary Y/N	How it works
<ul style="list-style-type: none"> - Technical information - Facilitate information and knowledge sharing among participating countries and other stakeholders 	Farmers and farmers Associations, processors/agribusinesses/manufacturers/investors/traders, financial Institutions, professional associations, scientists, extension staff, community-based organizations, NGOs, and media.	N	<p>The RRCoE will employ various communication methods/channels which can be used in combinations to reach various targeted audiences. A baseline study was carried out to identify needs of key stakeholders. In selecting the 'right' medium for a target group of people to reach and influence, the strategy identifies the media that the target audience reads/listens to, access frequently and dependably. The chosen media has the following qualities:</p> <ul style="list-style-type: none"> • The widest coverage of the target group. • The greatest frequency of access and reference by the target group. • The greatest credibility of the medium content, style, authoritative and relevant to the target group's motives and interests.
Contact Information		References, articles	Comments
EAAPP Focal Person Division of Research & Development		www.erails.net/TZ/rrcoe-eaapp/rrcoe-eaapp-tanzania/Home/	

Rice Regional Centre of Excellence		To be implemented
<p>Ministry of Agriculture Food Security & Cooperatives P.O. Box 2066, Dar es Salaam, Tanzania Email: hussein.mansoor@gmail.com, hussein.mansoor@kilimo.go.tz. Tel: +255-22-2865314 Fax: +255-22-2860444</p> <p>Rice Regional Coordinator EAAPP-Regional Rice Center of Excellence ARI-KATRIN, Private Bag, Ifakara Tel: +255-23-2625078 Fax: +255-23-2625361</p> <p>Email: katrin@iwayafrica.com, nkibanda2000@yahoo.com,</p> <p>EAAPP Desk Officer Email: ekanyeka@hotmail.com</p> <p>Dr. Janet Kaaya. Email: janetkaaya@gmail.com</p>	<p>Rice Regional Centre of Excellence Communication Strategy, 2012.</p>	

Appendix D: ICT Initiatives Completed or with Potential to Expand Scope in Tanzania

Status of “ongoing” indicates that a project is currently underway, whereas a status of “completed” indicates that the project has ended.

CAHNET Short Messaging System (SMS)			Status: Complete
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Cell phone (SMS)	- Cell phone companies/providers	- CAHNET (Community Animal Health Network) (Platform provider) - NGOs, veterinarians, community-based animal health workers, associations (Users)	Partially grant-supported; users pay for messages
Services offered	End-users	Intermediary Y/N	How it works
- Provision and exchange of information via SMS, including on markets, drugs, technologies, disease outbreaks, events and others.	10,000 of users in Tanzania including livestock keepers, farmers' associations, executive institutions (Ministry), extension officers and other groups (NGOs, veterinarians, community-based animal health workers, associations).	Y; farmers' associations, executive institutions, extension officers, and other groups (NGOs, veterinarians, community-based animal health workers, associations) assisting pastoralists.	CAHNET worked in Ethiopia, Kenya, Tanzania and Uganda. Users could ask questions, engage in discussions, and have fast and easy access to information. It was ideal as an early warning system.
Contact Information	URL	References, articles	Comments
CAHNET Tanzania Dr. Sultan Jaribu Mob:	www.cahnet africa.net/index.php	CAHNET SMS User Guide www.cahnet africa.net/assets/bk_sms_us	Downsides of this project were 1) the server was based in Nairobi and the SMS for

CAHNET Short Messaging System (SMS)			Status: Complete
+255-784-681144 Email: sultanj@iwayafrica.com CAHNET Regional Office Studio House, Fourth Floor, Marcus Garvey Road, Off Argwings Kodhek Road, Hurlingham P.O. Box 49502, 00100, Nairobi, Kenya T: +254 (20) 2731664 • 2732203 • 2732044 F: +254 (20) 2732086		er_guide_english_2010.pdf	Tanzanian would cost twice than what an in-country SMS would cost; 2) the menu was in English, it never got to the stage of transitioning to swahili, although the messages could be deliver in swahili and more educated user groups would act as intermediaries and would pass the information to livestock keepers and farmers.

Connected Farmer Alliance			Status: On-going
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
Cellphone	Vodafone, mobile telecommunications company	<ul style="list-style-type: none"> - U.S. Agency for International Development (USAID), - TechnoServe 	Grant-based to start then users would pay for services.
Services offered	End-users	Intermediary Y/N	How it works
Mobile phone applications to securely transfer and receive payments, access other financial services, and facilitate linkages to local and multinational agribusinesses.	Target of 500,000 small-scale farmers	N	The partnership aims to increase productivity, incomes and resilience of smallholder farmers in Kenya, Mozambique, and Tanzania. Mobile applications that enable rural households to transfer and receive payments securely, access other financial services, and facilitate linkages to local and multinational agribusinesses will be developed by Vodafone

Connected Farmer Alliance			Status: On-going
			and TechnoServe. The initiative looks for actively involve farming communities and supply chains.
Contact Information	URL	References, articles	Comments
Drew Johnson Djohnson@tns.org Mike Elliot melliot@tns.org		USAID Press release: New Farmer Alliance to Improve Incomes and Food Security in Africa. Tuesday, June 12, 2012. http://www.usaid.gov/news-information/press-releases/new-farmer-alliance-improve-incomes-and-food-security-africa Accessed January 8, 2013	Initiative launched in 2012.

Digital Early Warning Network (DEWN), part of the Great Lakes Cassava Initiative (GLCI)			Status: Complete
ICTs employed	Profit actors	Non-profit and/or public actors	How it works
<ul style="list-style-type: none"> - Mobile phones (GSM phone and SIM card) - GPS - Digital camera 		<ul style="list-style-type: none"> - Lake Zone Agricultural Research and Development Institute (LZARDI) - International Institute of Tropical Agriculture (IITA). - Tanzania Root and Tuber Crops Program (TRTCP) - Maruku Agricultural Research and Development Institute. - Great Lakes Cassava Initiative (GLCI) implemented by Catholic Relief Services (CRS) - UK-based Food and Environment Research Agency (FERA) - Bill and Melinda Gates Foundation 	Farmers were organized in groups; each group was trained in the recognition of the Cassava Mosaic Disease (CMD) and the Cassava Brown Streak Disease (CBSD). Groups received a SIM card topped up monthly. Farmers observed disease presence and spread and met once a month to share findings and report disease evidence and severity to LZARDI via text message. If more than 10% of the farmers of a group reported the diseases in a previously clean area or observe an increase in disease prevalence, researchers visited the area to verify and provide disease control advice. Validation of

Digital Early Warning Network (DEWN), part of the Great Lakes Cassava Initiative (GLCI)			Status: Complete
		(Donor)	farmers' reports was done after 6 months. GPS and digital cameras were provided for district partners.
Services offered	End-users	Intermediary Y/N	Business model
Disease control advice	1281 farmers, organized in 60 groups, from 10 districts in Northwestern Tanzania.	N	grant-based
Contact Information	References, articles		Comments
Catholic Relief Services (CRS) 228 W. Lexington St. Baltimore, Maryland 21201-3413 888-277-7575 info@crs.org	<ul style="list-style-type: none"> - World Bank, infoDev, ARD. 2011. "e-sourcebook ICT IN AGRICULTURE, Connecting Smallholders to Knowledge, Networks, and Institutions." Report Number 64605. - www.crsprogramquality.org/storage/pubs/agenv/glci-final-report.pdf - www.ictinagriculture.org/ictinag/sourcebook/module-5-increasing-crop-livestock-and-fishery-productivity-through-ict - http://r4dreview.org/2011/04/dewn-a-novel-surveillance-system 		Interesting outputs/outcomes: 1) Information received from farmers was used for researchers to build maps of disease spread; 2) Disease mitigation efforts were concentrated on newly affected areas.

Great Lakes Cassava Initiative (GLCI)			Status: Complete
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
<ul style="list-style-type: none"> - Internet (eLearning) - Mobile phones (Frontline SMS for project monitoring and 	<ul style="list-style-type: none"> - Agilix Learning Services 	<ul style="list-style-type: none"> - International Institute for Food, Agriculture and Development of Cornell University - Catholic Relief Services (CRS) 	grant-dependent

Great Lakes Cassava Initiative (GLCI)			Status: Complete
evaluation)			
Services offered	End-users	Intermediary Y/N	How it works
<ul style="list-style-type: none"> - Training modules focused on cassava disease control, seed multiplication and dissemination, farmer group strengthening, and GPS. - SMS to cellphone data base. 	<ul style="list-style-type: none"> - Extension agents - Local implementing NGOs * unknown/unreported number 	N	<p>e-learning modules called “GoCourses” were uploaded to mini-laptops and made available both online and offline. After students went through the courses, they would connect to the internet to upload their results. Course administrators could see grades and provide more resources and additional help when needed. Courses were offered in English and French. Students who passed would receive a certificate to train farmers.</p> <p>Frontline SMS was used to inform and remind staff about deadlines, prompting non compliers, and enabling technical issues reporting.</p>
Contact Information	References, articles		Comments
<p>Catholic Relief Services (CRS) 228 W. Lexington St. Baltimore, Maryland 21201-3413 888-277-7575 info@crs.org</p>	<p>World Bank, infoDev, ARD. 2011. “e-sourcebook ICT IN AGRICULTURE</p> <p>Connecting Smallholders to Knowledge, Networks, and Institutions.” Report Number 64605.</p> <p>www.ictinagriculture.org/ictinag/content/4th-annual-crs-ict4d-conference-story-three</p>		<ul style="list-style-type: none"> - Initiative combined e-learning with the ability to “certificate” trainers who later would train farmers, providing “value added” to students. <p>Project staff reported:</p> <ul style="list-style-type: none"> - Initial setup is costly and labor intensive. - Concern regarding trained students leaving for better paying positions after being trained. - Graphics and videos worked the best. - Viruses were an issue. Incentives were given to students to keep laptops clean. - Not as successful in Tanzania as in other countries since courses were only delivered in English and French.

Heka Heka Vijijini ("busy busy in the village" in Kiswahili) program in Radio Maria – supported by African Farm Radio Research Initiative (AFRRI) from Farm Radio International.			Status: Complete
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Cellphone (SMS alerts, phone calls, voice messaging)		- Radio Maria - African Farm Radio Research Initiative (AFRRI) - Farm Radio International (FRI) - Frontline SMS - Freedom fone	Grant-based.
Services offered	End-users	Intermediary Y/N	How it works
Information on best poultry practices.	Farmers; Unknown/unreported total listeners.	N	Weekly, four-month segment to the program on how to improve local chicken management such as housing, diet, and vaccinations. Unofficially, Sullivan said, they referred to the program as the " <i>Kuku Hotline</i> " ("kuku" means "chicken" in Kiswahili). The competition lasted 1.5 and asked for testimonies left through voice messages on the use of the knowledge by farmers. A total of 2,499 calls were received, with 1,448 individual callers. They also received 297 SMS messages, either requesting information or submitting greetings. Many audio responses were later rebroadcast on the program.
Contact Information		References, articles	Comments
Tanzania Association of Radio Maria Nguah John Bosco Director Mikocheni Industrial Area Box 34573 DSM, Tanzania Phone: +255 (22) 2773837		"The Kuku Hotline, Tanzania" article http://en.flossmanuals.net/freedom-fone/farm-radio-international/ "Press One for Freedom Fone, Press Two for Farm Radio: How Stations Use Integrated Voice Response" article by Melissa Ulbricht on Aug 11, 2010 in	Pilot in 2010.

Heka Heka Vijijini ("busy busy in the village" in Kiswahili) program in Radio Maria – supported by African Farm Radio Research Initiative (AFRRI) from Farm Radio International.		Status: Complete
Fax: +255 (22) 2773813 Email: info.tan@radiomaria.org	MobileActive.org http://mobileactive.org/case-studies/freedom-fone-field Participatory Radio Campaigns and food security: How radio can help farmers make informed decisions (AFRRI, 2011). http://www.farmradio.org/wp-content/uploads/farmradio-prcreport20111.pdf	

First Mile Project			Status: On-going (began in 2005)
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
<ul style="list-style-type: none"> - Mobile phone (SMS and phone call) - E-mail - Internet (Linking Local Learners website platform) 		<ul style="list-style-type: none"> - Government of Switzerland (Donor) - International Fund for Agricultural Development (IFAD) (Donor) - Agricultural Marketing Systems Development Programm (AMSDP) of the Government of the United Republic of Tanzania. - International Support Group (Technical assistance) 	Grant-based
Services offered	End-users	Intermediary Y/N	How it works
<ul style="list-style-type: none"> - Market intelligence information (not only prices but also marketing techniques, quantities needed, when, where, and to whom farmers' 	Farmers, number unknown/unreported	<ul style="list-style-type: none"> - "Core district groups" previously established by AMSDP that involve district officials for agriculture or marketing, a representative of the local partner NGO and representatives of 	The district core groups were trained in how to develop market chains and how to use the internet-based Linking Local Learners platform. They have different strategies to help farmers. One of them are the "market spies" (<i>shu shu shus</i>) who would provide market

First Mile Project			Status: On-going (began in 2005)
<p>products can be sold).</p> <ul style="list-style-type: none"> - Information on best agricultural practices. 		<p>local farmers, processors and traders.</p> <ul style="list-style-type: none"> - Market spies “<i>shu shu shus</i>” who belong to the core district groups. 	<p>intelligence information to the farmers through SMS and other mechanisms. The core groups share their experiences (lessons and best agricultural practices) through the Linking Local Learners platform, but also help farmers to use the platform, or access to email (basic internet use training). Core groups share knowledge gained through the Linking Local Learners platform with farmers’ groups and others throughout the district through mobile phones, face-to-face meetings, village billboards and other channels.</p>
Contact Information		References, articles	Comments
<p>Clive Lightfoot Leader, First Mile Project Executive director, International Support Group E-mail: clive.lightfoot@linkinglearners.net Tel: +44 1243601473</p> <p>Skype: lightfoo2000</p>		<p>www.ifad.org/rural/firstmile/index.htm</p> <p>www.ifad.org/rural/firstmile/FM_2.pdf</p>	<p>The very introduction of this project says “While communication technology is important, real success depends on building trust and collaboration along the market chain.” Project participants met and discuss project impact after 10 months the project started. They agreed that after one season there had been considerable impact on their access to markets and on their production and incomes.</p> <p>Internet is the ICT used but then the knowledge is spread using cellphones, among other traditional methods (village billboards, face-to-face meetings, etc.). The project leaders believes that “more efficient ways to get e-mail and Internet-based information into mobile phone handsets will be the key for enabling farmers to connect directly with Linking Local Learners”.</p>

Market Information System (MAMIS), www.mviwata.org			Status: On-going
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Cellphone (SMS)		- Mtandao wa Vikundi vya Wakulima Tanzania (MVIWATA)	Sustained by MVIWATA. In turn, MVIWATA is supported by the Tanzania government and local and international NGOs.
Services offered	End-users	Intermediary Y/N	How it works
- Receives, stores, processes and disseminates various market information.	Farmers; traffic is 3,000 users/month.	N	Users can send a request SMS to 0654 555 884. They can access information about sellers and buyers (quantities to buy or sale, prices offered). The number of markets integrated into MAMIS has increased from 12 markets in 2010 to 25 markets 2011 from Tanzania and Kenya.
Contact Information		References, articles	Comments
Executive Director MVIWATA P.O. Box 3220 Morogoro Tel: 023 261 41 84 Fax: 023 261 41 84 Email: info@mviwata.org Website: www.mviwata.org		William Mato (matobill@gmail.com) - email communication 12/11/2012. "Achievements" on website www.mviwata.org/?p_id=65	

Rural Communication Access Centres in Tanzania by IICD (Crop Marketing Bureau Ltd. - CROMABU-, Magu - Mwanza)			Status: Ongoing (began in 2007)
ICTs employed	Profit actors	Non-profit and/or public actors	Business model
- Cellphone (phone call and SMS). - Outdoor board at each	Crop Marketing Bureau Ltd	IICD	Donor-funded

Rural Communication Access Centres in Tanzania by IICD (Crop Marketing Bureau Ltd. - CROMABU-, Magu - Mwanza)			Status: Ongoing (began in 2007)
center.			
Services offered	End-users	Intermediary Y/N	How it works
- market prices	Farmers	Y (business center)	The business center collect market prices from nine markets in the district via SMS or call from sellers, and then posts them at the center
Contact Information	References, articles		Comments
	Thematic report www.iicd.org/files/Rural-Communication-Access-Centres-Tanzania-2007-Liang-Tan.pdf www.iicd.org/articles/2018ict-missionary2019-in-tanzania-sets-up-successful-rural-services-centre#		Sounds like a good local opportunity, as we talked that people goes to places to charge their cell phones, they can see the prices while the are waiting.

Appendix E-1: Key Stakeholders – Brief Profiles

Below is a complete list of key stakeholder (players) in the realm of ICT applications employed in Tanzania. They are sorted according to their principle function (service provider, information provider, or donor/NGO) with respect to the type of ICT initiatives they are involved in in Tanzania. These stakeholders fill a variety of roles. **Service providers** offer customizable software and communication platforms to connect agricultural specialists to farmers.

Information (or content) providers provide expertise on issues confronted by farmers.

Donors and NGOs provide essential funding, monitoring and evaluation, and coordinative efforts to connect providers and users. Following these lists, in Appendix E-2, are in-depth profiles of those selected stakeholders which are particularly prominent or promising for such initiatives.

Service Providers

Name	Contact information	Brief
Agronomy Technology Ltd.	Neill Stewart Managing Director neill@agrotechltd.com Phone: +265 21 195 5813 www.agrotechltd.com	Service provided on mobile data gathering, data management, cloud hosting. Main users are agriculture extension workers, higher-level producers, and exporters.
Esoko	www.esoko.com	Offers automated real-time mobile alerts, mass texting, options to share and access information between stakeholders, and mobile apps for polling.
Freedom Fone	Email: www.freedomfone.org/contact Phone: +263-4-776008/746448 Fax: +263-4-746418 www.freedomfone.org	Offers customizable software that allows users to share one-way relevant audio information with callers, crowdsource information via audience leaving voice messages, enable automated callback to eliminate cost for caller, create interactive voice menus to allow cross-lingual communication and topic classification/ specificity. Can be connected to voice over internet (such as Skype).
Frontline SMS	www.frontlinesms.com	Offers open source, customizable software for group mobile text messaging.
Magpi	www.episurveyor.org	Offers a self-service, web-based, “freemium” technology that permits surveying via sms.

Name	Contact information	Brief
		Services include: Free, Pro (\$5,000 per year), and Enterprise (\$10,000 per year). Free tier allows up to 20 forms and 100 questions per form
mAgri	info@gsmworld.com	mAgri is project of GSMA Mobile for Development. The mAgri Programme exists to catalyse the deployment of mobile solutions benefiting the agriculture sector through partnerships to provide funding and guidance to local ITC mobile projects.
Nuru Infocomm Ltd.	Dar es Salaam Tanzania Email: info@nuruinfo.com	Licensed application services provider based in Dar es Salaam. Currently providing high speed fibre access on Seacom and last mile solutions, SMS application services (ex: market prices) on short code for Premium SMS, and developing and deploying applications using mobile communication technology.
Vodafone Tanzania	Vodacom Tanzania Limited 1st Floor, Building No. 2 Mlimani City Office Park Mlimani City Sam Nujoma Road P. O. Box 2369 Dar es Salaam. http://www.vodacom.co.tz/	Cellular network offering GSM communication services, with more than 10 million customers across the country. Currently partner of the Connected Farmer Alliance (CFA) Kenya, Mozambique, and Tanzania, with Technoserve with support of USAID.
Voice of the farmer (Ipsos)	Ipsos Tanzania Aggrey Oriwo, Manager Aggrey.Oriwo@ipsos.com Migombani Street, Plot 161 P.O. Box 106253 Dar-Es Salaam Tanzania Tel: +255 22 277 5851 www.ipsos.com	Monitoring and evaluation using mobile phone (SMS and phone-based interviews).
Tanzania Communications Regulatory Authority (TCRA)	The Director General, TCRA Mawasiliano Towers, Plot 2005/5/1/2, Block C, Sam Nujoma Road P.O Box 474 Dar Es Salaam Tel: +255 22 2199760 - 8; +255 22 2412011 - 2 Director General Direct Line +255 22 2199769 Fax: +255 22 2412009 / +255 22	The regulatory body responsible for the communications and broadcasting sectors in Tanzania.

Name	Contact information	Brief
	2412010	
Tigo	MIC Tanzania LTD Head Quarters P.O.Box 2929 New Bagamoyo Rd, Dar Es Salaam, Tanzania. Phone: Dial 0716123103 Fax +255 22 2120474	Tigo is part of <u>Millicom International Cellular S.A (MIC)</u> and provides affordable, widely accessible and readily available prepaid cellular telephony services in the 26 regions of Tanzania. They also offer value added services of mobile internet access such as facebook and twitter Sms.

Information / Content Providers

Name	Contact information	Brief
Agricultural Research Centers	SARI: www.erails.net/TZ/sari/sari/ MARI: P O Box 6226, Dar es Salaam Phone: +255 2700552 Email: mari@mari.or.tz	Including Sealian Agricultural Research Institute (SARI), Mikocheni Agricultural Research Institute (MARI), and Naliendele Agriculture Research Institute (NARI); research local issues and disseminate knowledge through farmers extension.
Community Animal Health Network (CAHNET)	CAHNET Tanzania Dr. Sultan Jaribu Email: wamoneraj@yahoo.co.uk Website: www.cahnetafrica.net/	Enables networking and sharing of information regarding livestock via radio, print, word of mouth, mobile phones and the web.
Connected Farmer Alliance (CFA)	Drew Johnson Djohnson@tns.org Mike Elliot melliot@tns.org	Partnership to increase the productivity, incomes and resilience of smallholder farmers in Kenya, Mozambique, and Tanzania.
Farm Radio International	Head Office: Farm Radio International 1404 Scott Street, Ottawa, Ontario, Canada, K1Y 4M8 Tel: 1.613.761.3650 Fax: 1.613.798.0990 Toll-Free: 1.888.773.7717 Email: info@farmradio.org Tanzania: Margaret Kingamkono Regional Field Manager 141C Radio Road PO Box 16604	Share radio scripts, information packages, weekly electronic news, and an online community with African broadcasters; provide training services to broadcasters; work with partner radio stations to plan and deliver radio campaigns aimed at specific development challenge

Name	Contact information	Brief
	Arusha, Tanzania Tel/Fax: +255.732.978.997 Email: mkingamkono@farmradio.org Blog: http://blog.farmradio.org/fr/tags/tanzania/ (partially working)	
Health for Animals and Livelihood Improvement (HALI) Project	David Wolking One Health Institute - Wildlife Health Center University of California, Davis Ph: +1 415 690 9955; +1 530 341 3507 Skype: djwolking Email: djwolk@gmail.com Website: http://haliproject.wordpress.com/ Mailing address: HALI Project, PO Box 2263, Iringa, Tanzania, East Africa Street address: HALI Project, Gangilonga, Uhuru Street Block No. 123, Iringa, Tanzania	Works with local stakeholders to investigate health at the human-animal-environment interface in Tanzania. They will implement an initiative using cellphones for remote disease diagnosis and provision of human and livestock health information.
Infonet - Biovision	Regional Coordination and Awareness Anne Bruntse-Nganga, Agronomist Infonet-Biovision Office at ICIPE P.O. Box 30772-00100, Nairobi, Kenya Tel: +254 (0)20 863 2000 Direct: +254 (0)20 863 2112	A online and offline knowledge bank; Information about different crops, pest and disease, conservation agriculture, and Publications and database of TOF Organic Farmer Magazine
Ministry of Agriculture Food Security & Cooperatives	Dr. Janet Kaaya Division of Research & Development P.O. Box 2066, Dar es Salaam, TANZANIA Tel: +255-22-2860326 Skype address: janeOZU Email: janetkaaya@gmail.com	From the Tanzania Government website, the vision of the Ministry of Agriculture, Food Security and Cooperatives is: "envisaged of the ministry that is substantially commercial, competitive, highly diversified, that ensures food security, improves rural livelihood, expands rural employment and acts as an effective basis for economic growth and inter-sectoral linkages, while utilising natural resources in an overall sustainable manner."
National Network of Farmers' groups of Tanzania (Mtandao wa Vikundi vya Wakulima Tanzania - MVIWATA)	Stephen Antigon Ruvuga Executive Director P.O. Box 3220 Morogoro Tel: 023 261 41 84 Fax: 023 261 41 84 Email: info@mviwata.org www.mviwata.org	Founded in 1993, MVIWATA "aspires to empower smallholder economically and socially farmers through capacity building and undertake lobbying and advocacy especially by strengthening their groups and networks, facilitating communication and learning so that they are capable of defending their interests" (MVIWATA, 2012).

Name	Contact information	Brief
		Delivers information to farmers via cellphone ³⁴ .
National Parks	P.O Box 3134 Arusha, Tanzania Call: +255 272 503 471 +255 272 504 082 Fax: +255 272 508 216 E-Mail: info@tanzaniaparks.com www.tanzaniaparks.com	The Tanzanian National Parks Service has made significant efforts to spread awareness about conservation and climate change, including what actions farmers can take to join in environmental conservation efforts.
Njombe Development office (NDO)	Fr. Nestor Mtweve Diocese director for Caritas and Njombe Development office (NDO, and NGO) Catholic diocese of Njombe. P.O.Box 54 Njombe, Iringa. Tanzania Email: nestor.mtweve@gmail.com Skype: nmtweve Tweeter: @nestorkayombo	Supports and carries out projects in hydroelectricity, sustainable agriculture, rural water supply, orphans and vulnerable children, and gender.
Strengthening Documentation, Communication and Dissemination of Information Related to Climate Change Impacts, Adaptation and Mitigation in Tanzania	www.infosysplus.org/db/db_index.php/door/upcome/main_unit/organisation/data_set_id/3252/URL_NAME/asareca	Provides an Open Access Repository (OAR), Information Resource Center, Question and Answer service (QAS), the CCIAM website, and Document Delivery service.
Sokoine University of Agriculture (SUA)	Sokoine University of Agriculture, P.O. Box 3000, Chuo Kikuu, Morogoro -Tanzania Tel. + 255 23 2603511-4. Telefax: + 255 23 2604651 E-mail: sua@suanet.ac.tz Website: www.suanet.ac.tz/	A public institution; the only agricultural university in Tanzania. Extension, research, information resources.
Tanzania Association of Radio Maria	Nguah John Bosco Director Mikocheni Industrial Area Box 34573 DSM, Tanzania	Radio with national coverage and agricultural programs.

³⁴ William Mato (matobill@gmail.com), email communication 12/11/2012

Name	Contact information	Brief
	Phone: +255 (22) 2773837 Fax: +255 (22) 2773813 Email: info.tan@radiomaria.org	
Tanzania Society of Agricultural Education and Extension (TSAEE)	Beny Mwenda Email: batistabeny@gmail.com Website: http://tsaeelakezone.org/tsaee/ (under construction)	Society of agricultural experts supporting initiatives to increase agricultural production of rural and peri-urban farmers in Tanzania. Provides training, guidance, consultation and technical assistance to attain community-based participatory rural development.
Veterinary Investigation Centers (VICs)	Veterinary Investigation Centre, Tanzania PO Box 1068, Arusha, United Republic of Tanzania Phone: +255 27 2501464 Website: www.dfid.gov.uk	A project of the British Department for International Development that researches and disseminates information regarding improved pastoral management with a focus on local issues.

Donors, Investors and NGOs

Name	Contact information	Brief
American Institute for Research	1000 Thomas Jefferson Street, NW Washington, D.C. 20007 Phone: (202) 403-5000 TTY: (877) 334-3499 Fax: (202) 403-5454	The goal of the organization is “to use the best science available to bring the most effective ideas and approaches to enhancing everyday life.”
Bill and Melinda Gates Foundation	500 Fifth Avenue North Seattle, WA 98109 (206) 709-3100 info@gatesfoundation.org	They support number of different project in Tanzania such as Voice Farmer Radio
CABI International	CABI Nosworthy Way Wallingford Oxfordshire OX10 8DE UK Tel: +44 (0)1491 832111 Fax: +44 (0)1491 833508 Email: enquiries@cabi.org	CABI is a not-for-profit science-based development and information organization.
Friends of Ruaha Society	www.friendsof ruaha.org/home.html	FORS aims to conserve the Ruaha ecosystem by increasing environmental

Name	Contact information	Brief
(FORS)		awareness in the communities that border Ruaha National Park, thereby ensuring that local people understand the balance between themselves, wildlife and the environment.
GSMA	Seventh Floor 5 New Street Square New Fetter Lane London, EC4A 3BF UK Tel: +44 (0)207 356 0600 Fax: +44 (0)20 7356 0601 Email: info@gsmworld.com	Unites “mobile operator members, the wider mobile industry, and the development community to drive commercial mobile services for underserved people in emerging markets.”
Heifer International	Heifer International P.O. Box 8058 Little Rock, Arkansas 72203-8058 (800) 422-0474	The goal of this organization is to work with communities to end hunger and poverty and care for the earth.
IICD, International Institute for Communication and Development	Raamweg 5, 2596 HL The Hague, the Netherlands Tel: +31 (0)70 311 73 11 http://www.iicd.org/ Website - Contact form: http://www.iicd.org/contact-form	From website, their mission is “to help 10 million people with low incomes in Africa and Latin America create opportunities to shape their future and their society through access to and use of information and communications technology. IICD is currently active in Bolivia, Burkina Faso, Ethiopia, Kenya, Ghana, Malawi, Mali, Peru, Tanzania, Uganda and Zambia.”
Livestock Climate Change CRSP, Colorado State University	Livestock-Climate CRSP Colorado State University Campus Delivery 1644 Fort Collins, CO 80523-1644 Email: lcccrsp@colostate.edu	The USAID funded project supports integrated research that helps small-scale livestock holders adapt to environmental and health impacts of climate change in Sub-Saharan Africa and South Asia.
North-South Center	Rua de São Caetano, n° 32, 1200-829 Lisbon, Portugal Tel. (+351) 21 358 40 30 Fax (+351) 21 358 40 37 / 72 Email: nsinfo@coe.int	The aim of the organization is “promoting dialogue and cooperation between Europe, the South of the Mediterranean and Africa, and building a global citizenship based on human rights and citizens' responsibilities”.
Rural Livelihood Development Programme (RLDP)	Rural Livelihood Development Company Mezzanine & 2nd Floor, NBC Buidling, Nyerere Street P.O. Box 2978, Dodoma	RLDP is an initiative of the Government of Switzerland and supported through the Swiss Agency for Development and Cooperation (SDC). Supports market

Name	Contact information	Brief
	Tanzania, East Africa Tel. +255 26 2321455, Fax +255 26 2321457 E-mail: info@rldc.co.tz www.rldc.co.tz www.rldc.co.tz	development, and introduction of innovative and sustainable practices through diverse initiatives including rural radio.
Rural Urban Development Initiative	Plot No.217/218, Off Kimweri Road, Msasani Village, P.O.BOX 78741, Dar es Salaam,TANZANIA. Tel: +255 (0)22 2601873 Fax: +255 (0)22 2601874 www.ruditz.org Email: info@ruditz.org	A private sector development organization based in Tanzania that works to improve income and employment opportunities for micro-small enterprises (MSEs), including farms, through market links and information, policy change strengthened associations, and business skills training.
Savannah Fund	Mbwana Ally Managing Director Nairobi. Email: mbwana@savannah.vc	Technology investor. Currently present with the biNu platform, which allows low-tech cellphones access to internet application under a low internet bandwidth. The platform can host applications.
UK's Department for International Development (DFID)	Tel: +44 (0) 1355 84 3132 (from outside the UK) Fax: +44 (0) 1355 84 4099 Email: enquiry@dfid.gov.uk	Governmental organization supporting a wide range of development initiatives internationally, including in agriculture.
Winrock International	Kees Vogt Water, Livelihoods and Private Sector Lead iWash Programme Morogoro, Tanzania Phone: +255 683 444448 Skype: kees.vogt	The overall goal of this organization is to empower the disadvantaged, increase economic opportunity, and sustain natural resources.
World Vision Tanzania (WVT)	Tim Andrews WVT National Director P.O. Box 6070, Arusha, Tanzania Tel: +255 27 549252/58 Fax: +255 27 2549259 http://beta.wvi.org/tanzania http://beta.wvi.org/tanzania	WVT has been in Tanzania since 1970 and implemented number of different project.

Appendix E-2: Key Stakeholders – Detailed Profiles

In the following tables a subset of the key players listed in Appendix E-2 are profiled in more detail. They are again sorted according to their principle function. **Service providers** offer customizable software and communication platforms to connect agricultural specialists to farmers. **Information (or content) providers** provide expertise on issues confronted by farmers. **Donors and NGOs** provide essential funding, monitoring and evaluation, and coordinative efforts to connect providers and users.

Detailed Profiles – Service Providers

Agronomy Technology Ltd, www.agrotechltd.com		Services offered	End-users
Type	For-profit	<ul style="list-style-type: none"> - Mobile data gathering system working in Blackberry, Java, Android, Windows Mobile 6.5 and older. - Technical services (GIS) - Data management services - Cloud hosting 	The main users are agriculture extension workers, higher-level producers, and exporters. Agro-Tech works primarily with private sector clients (currently in the tobacco and mining) and an NGO working in forestry and is actively looking for work with organizations involved with outgrower projects.
Contact		References, articles	Comments
Agronomy Technology Ltd. Lilongwe, Malawi	info@agrotechltd.com Phone: +265 21 195 5813	Agro-Tech profile USAID Reports (dropbox)	Looks like it can be used to train local extensions on how to collect and managing data.

Esoko, www.esoko.com/about/index.php		Services offered	End-users
Type	Non-profit	<ul style="list-style-type: none"> • automated mobile alerts of real-time market and weather information (such as crop, seed, fertilizer prices; demand; news; etc), • “bulk SMS Push” for large buyers/sellers and awareness campaigns • options to share and access information between stakeholders through library, maps, networks, contacts, privacy and sharing options • call centre • mobile apps for polling, bids and offers, etc. 	<ul style="list-style-type: none"> • buyers and sellers of agricultural supplies and products • government and NGO campaigners • pollsters • small farmers
Contact		References, articles	Comments
		<p>see Esoko Profile at https://communities.usaidallnet.gov/ictforag/node/69</p>	<p>Highly promising in its flexibility, appeal to a wide variety of stakeholders, employment of widely used technology, real-time multi-way communication, and financial self-sustenance (not dependent on donors, and fees make the service seem more desirable/valuable to user). Especially promising in that it informs users rather than educating them, leaving the user to determine what information they access and how they utilize that info. Uniquely, networks stakeholders to each other, not just to a sponsoring institution/organization. Website is clear and easy to navigate. This initiative stands out to me.</p>

Freedom Fone, www.freedomfone.org		Services offered	End-users
Type	non-profit	<ul style="list-style-type: none"> • Share one-way relevant audio information with callers, such as focused agricultural extension information • Crowdsourcing information via audience leaving voice messages • Automated callback to eliminate cost for caller • Interactive voice menus to allow cross-lingual communication and topic classification/specificity • Can be connected to voice over internet (such as Skype) • 	Users include organizations trying to reach large groups of people. In Tanzania, used by radio stations with focus in agriculture such as FADECO and Radio Maria (<i>Kuku</i> -chicken- Hotline, tested for 1.5 month in 2010 received 2,499 calls with 1,448 distinct (unique) callers) and 297 SMS messages).
Contact		References, articles	Comments
www.freedomfone.org/contact Phone: +263-4-776008, +263-4 746448 Fax: +263-4-746418		See Freedom Fone profile https://communities.usaidallnet.gov/ictforag/node/319 “The Kuku Hotline, Tanzania” article http://en.flossmanuals.net/freedom-fone/farm-radio-international/ “Press One for Freedom Fone, Press Two for Farm Radio: How Stations Use Integrated Voice Response” article by Melissa Ulbricht on Aug 11, 2010 in MobileActive.org http://mobileactive.org/case-studies/freedom-fone-field	Seems most applicable for use by radio stations as a way for listeners to provide feedback. Two-way communication seems delayed and superficial, so impact on farmer’s livelihood decisions seems limited. Could be useful for conveying very specific questions to extension offices/agents if turnaround is quick enough (such as for M-Kilimo-type or Farmer Voice-type project). The fact that only two radio stations in Tanzania (in spite of the large Farmer Voice initiative) is using this technology suggests that it may be of limited use.

Frontline SMS, www.frontlinesms.com		Services offered	End-users
Type	Non-profit	open source, customizable software that permits group messaging apps	In Tanzania, currently being used in agriculture by Technoserve and FADECO radio. 27,000 downloads worldwide, of whom ~5000 work in agriculture. These downloads may or may not be using the service for agricultural purposes, and the number of downloads occurring in Tanzania is unreported/unknown.
Contact Information		References, articles	Comments
		FrontlineSMS profile at https://communities.usaidallnet.gov/ictforag/node/304	The potential of this technology is left up to the user; it can be modified heavily to serve a variety of purposes. Seems limited to communication between NGO and user, doesn't tend toward inter-user communication. Unclear whether consulting is currently profitable enough to completely offset costs. Website is confusing.

Magpi, www.episurveyor.org		Services offered	End-users
Type	Non-profit	A self-service, web-based, "freemium" technology that permits surveying via sms. Services include: Free, Pro (\$5,000 per year), and Enterprise (\$10,000 per year). Free tier allows up to 20 forms and 100 questions per form	10,000 user accounts worldwide in 2010, including NGOs, governments etc. Number in Tanzania is unreported/unknown.
Contact		References, articles	Comments
https://datadyne.zendesk.com/anonymous_requests/new		Magpi (formerly EpiSurveyor) profile at https://communities.usaidallnet.gov/ictforag/node/345	This ICT is very focused on organizations conducting surveys, making it not directly useful to farmers, although when used by agricultural organizations, it can improve extension efforts by providing information regarding small farmer's needs.

Nuru Infocomm Ltd, http://nuruinfo.com		Services offered	End-users
Type	For-profit	A mobile java application enabling market price collectors to use their mobile forms to collect and send data three times a week on Nuru phones.	Farmers
Contact		References, articles	Comments
Based in Dar es Salaam, Tanzania.	Email: info@nuruinfo.com		

Voice of the farmer		Services offered	End-users
Type	Profit	Interviews for Monitoring and Evaluation	Farmers
Contact		References, articles	Comments
Ipsos Tanzania Aggrey Oriwo, Country Manager, Aggrey.Oriwo@ipsos.com Migombani Street, Plot 161 P.O. Box 106253 Dar-Es Salaam Tanzania Tel: +255 22 277 5851		Final Report on the Great Lakes Cassava Initiative R4D Review, Issue 6, March 2011. Toolbox - DEWN: a novel surveillance system. www.crsprogramquality.org/storage/pubs/agenv/glci-final-report.pdf http://r4dreview.org/2011/04/dewn-a-novel-surveillance-system/	Synovate was a company bought by Ipsos. Apparently, the service can still be provided.

In-Depth Profiles: Information / Content Providers

Infonet-Biovision, www.infonet-biovision.org		Services offered	End-users
Type	Non-profit	A online and offline knowledge bank; Information about different crops, pest and disease, conservation agriculture, and Publications and database of TOF Organic Farmer Magazine	Farmers, Extension agents
Contact		References, articles	Comments
Regional Coordination and Awareness Anne Bruntse-Nganga, Agronomist Infonet-Biovision Office at ICIPE P.O. Box 30772-00100, Nairobi, Kenya Tel: +254 (0)20 863 2000 Direct: +254 (0)20 863 2112			The offline material (CD and DVDs) sounds promising for use by extension agents.

Health for Animals and Livelihood Improvement (HALI) Project, http://haliproject.wordpress.com/		Services offered	End-users
Type	Public	<ul style="list-style-type: none"> - Remote disease diagnostic system (automatic) - Livestock and human health information - Disease monitoring surveillance 	<ul style="list-style-type: none"> - Pastoralists; 160 “households” during the pilot phase. - It is expected to include villagers in the future. - Livestock Extension Agents Ruaha ecosystem, Iringa.
Contact		References, articles	Comments
David J. Wolking One Health Institute - Wildlife Health Center University of California, Davis		Personal communication 01/04	HALI started in 2006, funded through grant and private donations.

Phone: +1 415 690 9955; +1 530 341 3507 Skype: djwolk; Email: djwolk@gmail.com		
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Njombe Development office (NDO), www.ndo-njombe.8m.com		Services offered	End-users
Type	Non-profit	Supports and carries out projects in hydroelectricity, sustainable agriculture, rural water supply, orphans and vulnerable children, and gender.	Villagers, farmers; 6,656 farmers reached in its different agricultural current and complete projects.
Contact Information		References, articles	Comments
Fr. Nestor Mtwewe Diocese P.O.Box 54 Njombe, Iringa Tanzania nestor.mtwewe@gmail.com		Personal communication 01/05/2013; "Project under NDO" www.ndo-njombe.8m.com/index.htm	

Strengthening Documentation, Communication and Dissemination of Information Related to Climate Change Impacts, Adaptation and Mitigation in Tanzania, www.suanet.ac.tz/cciam/docs/cciam15.html		Services offered	End-users
Type	public	Open Access Repository (OAR) Information Resource Center Question and Answer service (QAS) CCIAM website Document Delivery service.	unknown/unreported
Contact		References, articles	Comments

www.infosysplus.org/db/db_index.php/door/upcome/main_unit/organisation/dataset_id/3252/URL_NAME/asareca no other information available.		There seems to be little or no attempt to make potential users aware of this service or make it user-friendly. Since internet connections are rare and expensive in Tanzania, it is unlikely that this service is readily accessible or used by small farmers.
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Tanzania Society of Agricultural Education and Extension (TSAEE), http://tsaeelakezone.org/tsaee		Services offered	End-users
Type	Non-profit	Training, guidance, consultation and technical assistance of agricultural experts to attain community-based participatory rural development.	NGOs, Community-based organizations (CBOs), farmer groups, etc.
Contact		References, articles	
Beny Batista Mwenda, Coordinator Email: batistabeny@gmail.com		PPT presentation "Tanzania Society of Agricultural Education and Extension (TSAEE) – Lake Zone as a Catalyst in Implementing the Tangible Goals Approach to Successful Rural	Development with Women and Youth": www.agriculture.go.tz/Mada%20za%20Mkutano/Dodoma/MADA%20ZINGINE/TSAEE%20LAKE%20ZONE.ppt

In-Depth Profiles: Donors and NGOs

Stakeholder Rural Livelihood Development Programme (RLDP), www.rldc.co.tz		Services offered	End-users
Type	Non-profit	Supports market development, and introduction of innovative and sustainable practices through diverse initiatives including rural radio.	Farmers; unknown/ number not reported.
Contact Information		References, articles	Comments
Mezzanine & 2nd Floor, NBC Bld, Nyerere		RLDC Website "Sectors" description, "About	RLDP is an initiative of the Government of

Street P.O. Box 2978, Dodoma Tanzania, East Africa Tel. +255 26 2321455, Fax +255 26 2321457 E-mail: info@rldc.co.tz	us".	Switzerland and supported through the Swiss Agency for Development and Cooperation (SDC).
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World Vision Tanzania (WVT), http://beta.wvi.org/tanzania		Services offered	End-users
Type	Non-profit	Regarding agriculture, their goal is to increase food security and surplus through more effective facilitation for adoption of better farming methods. Other initiatives include distribution of distributed agricultural inputs and training; actions to mitigate drought effects (Secure the Future initiative); financial services and products (Small Enterprises Development Agency (SEDA) -a micro finance institution affiliated to WVT; and loans with the WVT Talanta Serving and Credit Cooperative Society.	Related specifically to the agriculture subsector: - 4,000 farmers participate in the Secure the Future initiative. - 20,080 clients in the SEDA institution. - 6,400 clients in the TSACCOS initiative. - 473 village community banks established.
Contact		References, articles	Comments
Tim Andrews National Director P.O. Box 6070, Arusha, Tanzania Tel: +255 27 549252/58 Fax: +255 27 2549259		"Our work" http://beta.wvi.org/tanzania/our-work	

Appendix F: Contacts

Confirmed Contacts

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Dr. Sultan Hussain Jaribi, CAHNET (Community Animal Health Network) - Tanzania, January 4, 2013. Address: P.O.Box 632, Babati- Manyara Region, Tanzania. Mobile: +255 784 681144. Email: [\[wamoneraj@yahoo.co.uk\]](mailto:wamoneraj@yahoo.co.uk). Website: www.cahnetafrica.net/index.php

David Wolking, One Health Institute - Wildlife Health Center, University of California, Davis, January 4, 2013.

Telephone: +1 415 690 9955; +1 530 341 3507. Tanzania Mailing address: HALI Project, PO Box 2263, Iringa, Tanzania, East Africa. Tanzania Street address: HALI Project, Gangilonga, Uhuru Street Block No. 123, Iringa, Tanzania. Email: [\[djwolk@gmail.com\]](mailto:djwolk@gmail.com). Website: <http://haliproject.wordpress.com/>. Skype: djwolk.

Dr. Edda Tandi Lwoga, Sokoine University of Agriculture, January 4, 2013. Email: [\[t_lwoga@yahoo.co.uk\]](mailto:t_lwoga@yahoo.co.uk)

Fr. Nestor Mtweve, Diocese director for Caritas and Njombe Development office (NDO), January 5, 2013. Address: Catholic diocese of Njombe, P.O.Box 54, Njombe - Iringa, Tanzania. Mobile: +255 755 219750, +255 786 722274. Email: [\[nestor.mtweve@gmail.com\]](mailto:nestor.mtweve@gmail.com). Skype: nmtweve. Tweeter: @nestorkayombo.

Freedom Fone, January 8, 2013. Web contact form:[\[http://freedomfone.org/contact\]](http://freedomfone.org/contact)

Heather Cruise, UC Davis, January 9 2013. Email: [\[heatheracruise@gmail.com\]](mailto:heatheracruise@gmail.com)

Josh Woodward, FACET, January 3, 2013. Email: [\[jwoodard@fhi360.org\]](mailto:jwoodard@fhi360.org).

Kencall, provider of M-Kilimo Project, January 7, 2013. Telephone: +254 711 035 000.

Kees Vogt, Water, Livelihoods and Private Sector Lead, iWash Programme Morogoro Tanzania, Winrock International, January 6, 2013. Telephone: +255 683 444448. Email: [\[kvogt@field.winrock.org\]](mailto:kvogt@field.winrock.org). Skype: kees.vogt.

Marcely Madubi, Livelihoods and Private Sector Lead, Winrock International, iWASH Programme, January 10, 2013. Address: P.O. Box 768, Morogoro, Tanzania. Telephone/Fax: +255 23 261 3706. Mobile: +255 784 761 306/754 016 508. Email: [\[mmadubi@yahoo.co.uk\]](mailto:mmadubi@yahoo.co.uk).

Margaret Kingamkono, Regional Field Manager, Farm Radio International - Tanzania, January 8, 2013.

Address: 141C Radio Road /PO Box 16604, Njirol Arusha, Tanzania. Telephone: +255 784 695 028. Fax: +255 732 978997. Email: [\[mkingamkono@farmradio.org\]](mailto:mkingamkono@farmradio.org). Skype:mkingamkono. Blog: <http://blog.farmradio.org/fr/tags/tanzania/> (partially working).

Mbwana Ally, Managing Director, Savannah Fund (Nairobi, Kenya), January 3, 2013. Email: [\[mbwana@savannah.vc\]](mailto:mbwana@savannah.vc). Skype: mbwana0814.

Monique Hunziker, Project Manager Infonet, Infonet-Biovision, January 9, 2013. Email: [\[m.hunziker@biovision.ch\]](mailto:m.hunziker@biovision.ch)

Naomi Maselle, Office Manager Tanzania Telecenters Network (TTN) and Director of CROMABU telecenter, January 10, 2013. Mobile: +255 754 757086. Email: [naomimagilla@yahoo.com].

Neill Stewart, Managing Director, Agro Tech LTD, December 31, 2012. Email: Neill Stewart [neill@agrotechltd.com]

Richard Bruno, Humphrey Fellow UC Davis, African Institute for Capacity Development, December 26, 2012. Email: [rbruno@ucdavis.edu], [bruno.kinyaiya@gmail.com].

Salehe Hija Mohamed, Municipal Agriculture Extension Officer, Kinondoni Municipal Council, Dar es Salaam, Tanzania, December 12, 2012 (Andrea's contact, could confirm date). Email: [hijasalehe@gmail.com]

Sanga, Camilius <csanga@gmail.com>

Dr. Tumbo, Siza D. (Professor in Agricultural Engineering, Modelling and Automation, Dept. of Agricultural Engineering & Land Planning, Sokoine University of Agriculture, December 22, 2012). P.O. Box 3003

No Reply

Arid Lands Information Network (ALIN), Regional Office, e-mail to organization January 3, 2013. Address:

AAYMCA Building, State House Crescent off State House Avenue, PO Box 10098 - 00100 Nairobi, Kenya. Telephone: +254 (20) 2731557, Telefax: +254 (20) 2737813. Email: [info@alin.net]

CABI International, e-mail to organization December 31, 2012. Email: [enquiries@cabi.org]

Commonwealth of Learning, on e-mail to organization December 31, 2012. info@col.org

Clive Lightfoot from RAVInvest, First Mile Project and Linking learners website, e-mail December 26, 2012. Telephone: +44 124 3601473. Mobile: +44 796 9028705, Mob: +256 753 080483. Skype: lightfoot2000. Email: [clive.lightfoot@linkinglearners.net]. Website: www.ravinvest.biz.

FADECO Radio, e-mail to organization, December 21, 2012. E-mail: [fadeco@satconet.net]

Frank Habicht, Senior engineer, Simbanet and ISP, e-mail 12/28/2012. frank@simbanet.co.tz

IICD, message to organization December 31, 2012. Contact form: [www.iicd.org/contact-form]

KATC, e-mail to Organization, December 21, 2012. E-mail: [katc_mafc@yahoo.co]

MVIWATA (NGO), The Executive Director MVIWATA, email to organization December 27, 2012. Address: P.O. Box 3220 Morogoro. Telephone: 023 261 41 84. Fax: 023 261 4184. Email: [info@mviwata.org]. Website: www.mviwata.org.

M-Kilimo, e-mail to Company, December 31, 2012. [info@kencall.com]

Rice Regional Centre of Excellence, e-mail to institution December 28, 2012. EAAPP Focal Person:

Division of Research & Development, Ministry of Agriculture Food Security & Cooperatives. Address: P.O. Box 2066, Dar es Salaam, Tanzania. Email: [hussein.mansoor@gmail.com], [hussein.mansoor@kilimo.go.tz]. Telephone: +255-22-2865314. Fax: +255-22-2860444. Mobile: +255-784-262257. Website: www.erails.net/TZ/rrcoe-eaapp/rrcoe-eaapp-tanzania/Home/

Rice Regional Centre of Excellence, e-mail to institution December 28, 2012. Rice Regional Coordinator:

EAAPP-Regional Rice Center of Excellence, ARI-KATRIN, Private Bag, Ifakara. Telephone: +255-23-2625078. Fax: +255-23-2625361. Mobile: +255-784-419422. Email: [\[katrin@iwayafrica.com\]](mailto:katrin@iwayafrica.com), [\[inkibanda2000@yahoo.com\]](mailto:inkibanda2000@yahoo.com). Website: www.erails.net/TZ/rrcoe-eaapp/rrcoe-eaapp-tanzania/Home/

Rice Regional Centre of Excellence, e-mail to institution on 12/ 28/ 2012. EAAPP Desk Officer: Email: [\[ekanyeka@hotmail.com\]](mailto:ekanyeka@hotmail.com). Website: www.erails.net/TZ/rrcoe-eaapp/rrcoe-eaapp-tanzania/Home/

Sustainable Harvest Relationship Information Tracking System (RITS), e-mail to organization, December 21, 2012. E-mail: [\[info@sustainableharvest.com\]](mailto:info@sustainableharvest.com)

Technoserve, e-mail to Organization, December 21, 2012. E-mail: [\[technoserve@tns.org\]](mailto:technoserve@tns.org)

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Appendix G: Report Prepared by

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