



# National Cooperative Business Association NCBA CLUSA International

Mozambique New Alliance ICT Extension Activity

## **EXTENSÃO MULTIMÉDIA**

Cooperative Agreement No. AID-0AA-A-16-00003

**Final Program Report -- February 2016 to February 2019**

**MAY 2019**

A New Alliance for Food Security and Nutrition Project funded by USAID's Feed the Future, UK Aid and IFAD.



Mozambique New Alliance ICT Extension Activity

# EXTENSÃO MULTIMÉDIA

May 2019



This report relates to the progress achieved by the three-year Multimedia Extension Project (Extensão Multimedia) from February 2016 to February 2019. It includes descriptions of the main activities and accomplishments, collaboration with other New Alliance stakeholders, project performance and impact indicators, and the main lessons learned. It concludes with recommendations for future ICT enabled extension services and smallholder focused information systems, with a focus on sustainability.



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## Basic Information

Country/Region: <b>Mozambique</b>	Name of project/program
Cooperative Agreement No. AID-0AA-A-16-00003	Mozambique New Alliance ICT enabled Extension service – EXTENSÃO MULTIMÉDIA
Project duration : <b>February 2016 – February 2019</b>	Project donor representative: USAID Budget: USAID/ USD 1,999,999
Main objective of the project/program: Increase of agricultural productivity and reduction of poverty	
Implementing organizations: <b>NCBA CLUSA, Human Network International (HNI), Farm Radio international (FRI)</b>	
Main strategical partners: <b>MASA, SSTP, Vodacom Mozambique, community radio stations;</b>	
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## List of acronyms

<b>CLG</b>	Community listening groups
<b>DNEA</b>	National Directorate for Agrarian Extension
<b>FRI</b>	Farm Radio International
<b>HNI</b>	Human Network International
<b>ICT</b>	Information and Communication Technologies
<b>IVR</b>	Interactive Voice Response
<b>MASA</b>	Ministry of Agriculture and Food Security
<b>NCBA CLUSA</b>	National Cooperative Business Association Cooperative League of the United States of America
<b>PROMAC</b>	Promotion of Conservation agriculture
<b>RAMA-BC (CSA)</b>	Feed the Future Resilient Agricultural Markets Activity - Beira Corridor
<b>RAMA-NC (CSA)</b>	Feed the Future Resilient Agricultural Markets Activity - Nacala Corridor
<b>SMS</b>	Short Message Service
<b>SSTP</b>	Scaling Seeds and Technology Partnership
<b>USSD</b>	Unstructured Supplementary Service Data

## **Executive summary**

Information Communication Technologies (ICTs) such as those enabled by cellphones and the internet present new avenues to change the ways citizens and governments interact with each other and generate economic opportunities. In recent years they have become especially important in transforming service delivery in areas where traditional infrastructure and services are inadequate, particularly as they become more affordable and accessible.

At the 2012 Group of Eight (G8) industrialized nations meeting at Camp David, G8 and African leaders launched the New Alliance for Food Security and Nutrition to accelerate agricultural growth and productivity. The New Alliance agreed to support four integrated enabling actions aimed at significantly improving agricultural productivity. One of these was the Information and Communication Technologies (ICT) Extension Challenge Fund (NA-ICT CF) and a second, related, one was the Scaling Seeds and Technologies Program (SSTP).

The NA-ICT CF is delivered by the United States Agency for International Development (USAID), with additional funding from DfID, the Bill and Melinda Gates Foundation (BMGF) and the International Fund for Agricultural Development (IFAD). It aims to improve agricultural productivity in selected food crops by smallholder farmers by developing and scaling up the delivery of agriculture extension services using sustainable ICTs, including radio, mobile phones, video and web-based applications. This is with a view to complement non-ICT-based agricultural extension approaches delivered by public and private sectors, ultimately leading to an improvement and expansion of ICT-enabled extension services to large numbers of farmers. Gender was identified as the main cross-cutting issue of the NA-ICT.

Six NA-ICT implementation grants were awarded on a country-by-country basis in Ethiopia, Ghana, Malawi and Mozambique. This report is the final report of one of those grants, the MultiMedia Extension Project in Mozambique, implemented by NCBA CLUSA together with technical partners Human Network International (HNI) and Farm Radio International (FRI) between February 2016 and February 2019.

The MultiMedia Extension project aimed to provide remote, ICT enabled, extension services to smallholder farmers in Manica, Nampula, Zambézia and Tete provinces of Mozambique through three main ICT channels: 1) cellphone enabled IVR, SMS and USSD messages relating to Good Agricultural Practices, disseminated via HNI's 321 platform and the cellphone provider Vodacom; 2) participatory community radio programs aired by five community radio stations in northern and central Mozambique and 3) instructional videos, disseminated via community based solar powered videos screens. Messages were designed to provide users with information which would enable them to increase their agricultural production, including content relating to Good Agricultural Practices (GAPs), price and market information for the sale of off-take as well as information regarding the suppliers of agricultural goods and services.

MultiMedia Extension intended to reach a potential audience of 925,000 smallholder farmers, 90,000 of which - it was hoped - would go on to adopt at least one of the promoted practices and technologies. Despite challenges relating to Vodacom's insufficient network coverage in some rural districts, the weak infrastructure of many rural community radios (many of which lacked a constant electricity supply) and the logistical costs and obstacles of working in rural Mozambique, the project exceeded these targets by 192% and 405% respectively. The following are some of the project's main achievements during its three years of implementation:

- The Vodacom 321 platform provided three batches of agricultural content to Vodacom users via IVR, SMS and USSD messages (December 2016, December 2017 and November 2018). These messages included information about technologies and GAPs for cereals, roots and tubers, beans, horticulture and fruits (a broader list of value chains than was originally planned, in response to demand from project stakeholders and beneficiaries) in addition to offering price information and information regarding agricultural products and services such as seeds, inputs, services and financial products for the smallholder agricultural sector.
- Over 68,700 unique users (37% of which were women) accessed the Vodacom 321 platform, listening to messages broadcasted in the four most widely spoken languages in Mozambique – Portuguese, Macua (spoken in the north), Changana (spoken in the south) and Sena (widely spoken in the center).
- As well as providing information on GAPs, products and services the 321 platform showed itself to be a flexible mechanism for sharing information with thousands of citizens as and when critical agriculture-related issues arose in the country. This was the case with two national priorities, the Fall Army Worm (which presented as a nationwide threat to maize production) and the “pigeon pea crisis” in 2017 (which resulted in a sudden and unexpected drop in pigeon pea prices to the extent that some farmers were unable to recuperate their costs). In both cases the 321 platform was able to respond events by providing vital, timely information to farmers to help them mitigate these risks.
- Through six-month partnerships with five community radio stations along the Beira and Nampula corridors, 35 community radio staff were trained in interactive radio programming and the use of interactive, digital feedback tools with which to engage with their audiences. With project support, they produced and aired 186 live interactive radio programs with agricultural extension, GAP and price related content, reaching around 700,000 potential adult listeners. Nearly 440,00 people (63% of potential listeners, half of which were women) listened to at least one episode of the interactive community radio programs aired with project support.
- The same community radio stations were provided with the necessary equipment in order to ensure that they could disseminate radio programs in their communities without interruption, which they have continued to do beyond the life of the project.



- The project prepared and disseminated instructional videos demonstrating GAPs and, through organized community video screenings and working with community based agrodealers to show videos in their stores, disseminated these to over 2,000 members of the public in addition to private and public (Government and NGO) extension staff.
- Through all three ICT enabled channels, the project disseminated GAP and market related information to over 490,000 farmers. Many of these, due to their location or other factors, were excluded from traditional extension models - the project supported ICT channels were therefore their only source of agricultural information, making the information a real lifeline in terms of informing farmers of new technologies, improved agricultural practices, the farmgate value of their produce and how and where to obtain critical agricultural inputs such as seeds, fertilizers and tools.

Crucially, the project's support was intended to be provided through sustainable business models - hence, services were meant to be sustainable to the greatest extent possible without ongoing NA-ICT CF funding and remain operational beyond the three-year grant period. Although the project was able to cover nearly all ongoing operational costs from non-donor sources (an indicator of potential sustainability of the ICT operations), three years was, unsurprisingly, insufficient time to demonstrate that the ICT services could be fully sustainable in the longer term. Yet despite this the project was able to experiment with several possible avenues of embedding ICT extension services within the local market in order to generate sufficient revenue to sustain operations, indicating that financial sustainability is possible for ICT supported extension systems for smallholder farmers, for all three of the ICT channels promoted by the project (cellphone, radio and videos). These will be discussed in more detail in this report, particularly in the recommendations section.

In order to assess the impact of MultiMedia Extension and the other NA-ICT CF grantees, the following monitoring indicators were developed by the MEL contractor in collaboration with USAID and the grantees:

1. Indicator 1.1: Numbers of smallholder farmers with access to the ICT-enabled services.
2. Indicator 1.2: Numbers of smallholder farmers using ICT-enabled services
3. Indicator 1.3: Number of smallholder farmers and others who have applied improved technologies or management practices as a result of United States government (in this case NA-ICT CF) assistance
4. Indicator 1.4: Number of hectares under improved technologies or management practices as a result of United States government (in this case NA-ICT CF) assistance
5. Indicator 2.1: Percentage of costs of ICT-enabled services covered by non-donor sources.

The overall project performance against these indicators is summarized in Table 1, as follows:

Table 1. ICT Performance indicators (target vs actual)

Indicator		Target	Performance	% Performance	321		Radio		Video (AC method)	
					Target	Performance	Target	Performance	Target	Performance
1.1 Number of smallholder farmers with access to the ICT-enabled services	Male	606,250	851,340	140%	-	264,000	-	335,340	-	-
	Female	318,750	922,284	289%	-	286,000	-	363,284	-	-
	<b>Total</b>	<b>925,000</b>	<b>1,773,624</b>	<b>192%</b>	<b>550,000</b>	<b>550,000</b>	<b>375,000</b>	<b>698,624</b>	-	-
1.2 Number of smallholder farmers using ICT-enabled services	Male	217,850	255,179	117%	-	43,334	-	221,228	-	-
	Female	107,650	235,399	219%	-	25,374	-	218,744	-	-
	<b>Total</b>	<b>325,500</b>	<b>490,478</b>	<b>151%</b>	<b>137,500</b>	<b>68,708</b>	<b>188,000</b>	<b>439,972</b>	-	-
1.3 Number of smallholder farmers and others who have applied improved technologies or management practices as a result of the assistance	Male	59,188	199,318	337%	-	13,423	-	192,042	-	133
	Female	30,813	165,057	536%	-	11,089	-	159,053	-	108
	<b>Total</b>	<b>90,000</b>	<b>364,375</b>	<b>405%</b>	<b>27,500</b>	<b>24,432</b>	<b>62,500</b>	<b>351,095</b>	-	<b>250</b>
1.4 Number of hectares under improved technologies or management practices as a result of USG assistance	Male	14,797	264,127	1785%	-	15,964	-	255,562	-	53
	Female	7,703	218,474	2836%	-	15,553	-	209,124	-	29
	<b>Total</b>	<b>22,500</b>	<b>482,601</b>	<b>2145%</b>	<b>6,875</b>	<b>31,517</b>	<b>15,625</b>	<b>464,686</b>	-	<b>81</b>
1.5 Number of farmers who have received donor supported short-term agricultural sector productivity training or food security training	Male	n/a	n/a	n/a	-	-	-	-	-	-
	Female	n/a	n/a	n/a	-	-	-	-	-	-
	<b>Total</b>	n/a	n/a	n/a	137,500	-	188,000	-	-	-
2.1 Percentage of costs of ICT-enabled services covered by non-donor sources		<b>30%</b>	<b>92%</b>	<b>308%</b>	<b>90%</b>	<b>92%</b>	<b>20%</b>	<b>86%</b>	-	-

## **1. Introduction**

This report relates to the progress achieved by the three-year Multimedia Extension Project from February 2016 to February 2019. It includes discussions on the main activities and accomplishments, collaboration with other New Alliance stakeholders, project performance and impact indicators, and the main lessons learned. It concludes with recommendations for future ICT enabled extension services and smallholder focused information systems (particularly Market Information Systems or MIS), with a focus on how these can be made sustainable by embedding them within the local market system.

Extension services are crucial for stimulating smallholder farmers' use of technologies and GAPs which contribute to better yields, such as improved seed varieties, land preparation techniques, techniques to control pests and diseases and the use of fertilizer and agrochemicals. Additionally, extension services can provide price and market information which enable smallholder farmers to strategically engage with input/output markets as well as better access suppliers of agricultural inputs and services.

A major assumption in this project was that, as technologies advance and become more affordable, ICT platforms such as radio, video and mobile phone services are increasingly available to smallholder farmers as a vehicle for providing agricultural extension services. This could present huge benefits for a country such as Mozambique, where less than 5% of farmers receive traditional extension advice<sup>1</sup> and where ICT platforms have huge potential to be a cost-effective alternative to conventional extension systems. Using community radio programs, text messages, recorded voice messages and instructional videos, the project aimed to test the use of ICT to either complement or leapfrog conventional extension services, providing farmers with information regarding GAPs, commodity prices and agricultural input/service providers which would support them to adopt new technologies, increase their productivity and access output and input markets.

## **2. Summary of activities and accomplishments**

### **2.1 Good Agricultural Practice (GAP) related content available on the 321-platform**

#### *Summary of main 321 platform content*

The purpose of the 321 platform, managed by HNI and hosted by Vodacom, was to disseminate information - using IVR, SMS and USSD technology - regarding GAPs for priority smallholder value chains in Mozambique. Specific information packages were created and disseminated at three points during the project. Each batch covered up to five different value chains, with each value chain containing around eight GAP related messages organized around the main agricultural themes such as land preparation, sowing, pest control, fertilizer application, harvest, storage and sales. Messages were accessed by users selecting the topics that most interested them via their cellphone keypads (like a drop-down menu). For each

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<sup>1</sup> Ministério da Agricultura e Segurança Alimentar (MASA). (2015). Anuário de Estatísticas Agrárias 2012 - 2014. Maputo, Moçambique: Direcção de Planificação e Cooperação Internacional (DPCI).

theme users were offered the choice of hearing an IVR message or receiving either a USSD or SMS message. Figure 1 shows the main themes for the sesame value chain.

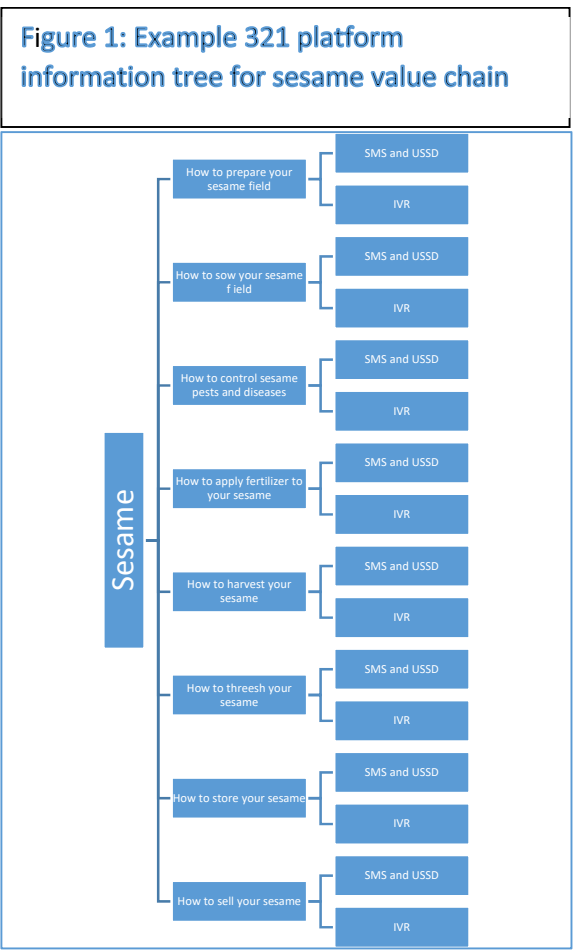
The 321 platform also disseminated other pertinent, and sometimes urgent, GAP-related information such as aflatoxin control and management of the Fall Army Worm. The latter was chosen due to its emergence as a national threat to maize production during the life of the project and will be discussed in more detail below.

In addition to GAP related content, the project also disseminated what it termed “dynamic information,” updated every two weeks, regarding: 1) agricultural goods and services available from companies operating in the agricultural sector, such as input suppliers, output buyers and traders, financial services and mechanization services, and 2) commodity price information. Thus, the 321-service served provided both technical, production related, advice in addition to information regarding prices, suppliers and markets for their production surplus. Section 2.1.1 below discusses this content in more detail.

Table 2 below demonstrates the three batches of information disseminated via the 321 platform during the project, which amounted to 480 different IVR, SMS and USSD messages.

*Prioritizing and designing the 321-platform content*

The project created Content Committee comprising of key government, NGO and private sector stakeholders (including other SSTP grantees) during the first quarter of the project. This ensured that 321 platform content was selected in a participative manner and was in line with all stakeholders’ priorities, most importantly those of the SSTP and the Government of Mozambique. The Content Committee was responsible for taking decisions regarding the value chains and associated GAPs to be promoted, in addition to creating the individual messages which were (after a process of pre-testing with smallholder farmers to confirm their appropriateness for the target audience) disseminated. Per the project design, the Content Committee prioritized the value chains promoted by AGRA’s SSTP project, namely maize, cassava, soya bean, groundnut and pigeon pea. However, when designing and creating the second and third (final) batches of information the project included other crops in response to farmers’ demands, such as horticultural crops. To ensure consistency in messaging, all



promoted value chains and GAPs were in line with NCBA CLUSA's and the Government of Mozambique's focus on promoting Climate Smart Agriculture.

Table 2: Information disseminated via the 321 platform during the life of the project

Batch #	Date	Content	Total number of messages disseminated
1	December 2016	GAPs for maize, cassava and soybean	90
		Commodity price information	
		Agricultural goods and services	
2	December 2017	Conservation agriculture, the Fall Army Worm, aflatoxin, GAPs for horticulture, orange flashed sweet potato, groundnut and pigeon pea	210
		Commodity price information	
		Agricultural goods and services	
3	November 2018	GAPs for rice, sugar beans, sesame, banana, papaya and cashew	180
		Commodity price information	
		Agricultural goods and services	
		<b>Total</b>	<b>480 messages</b>

In order to minimize the likelihood of delays in disseminating information, the Content Committee's membership and organizational structure was designed to make the committees flexible and responsive as possible. Its members convened several times per year to prioritize and design the key GAP content. Additionally, through regular email and other contact its members were able to produce and approve the more dynamic information relating to prices and products/services as well as respond to important agricultural issues as and when they arose. This last point is important because it showed that the 321 platform could play a vital role in disseminating critical information to citizens at relatively short notice. This was particularly the case with the Fall Army Worm, which posed a serious and sudden threat to maize production at a national level and was a priority by all agricultural stakeholders including the Mozambique including the local USAID mission in Maputo and the Ministry of Agriculture and Food Security. A similar case related to a sudden crash in the market for pigeon pea, which provoked what was considered by many stakeholders to be a national crisis for smallholders (see text box).

#### *Use of the 321 platform*

Of the three message channels used by the 321 platform, IVR was the most popular channel with 86,093 interactions, representing 65% of the total number of interactions (131,915) - probably due to low levels of literacy. This was followed by USSD and SMS (with 41,908 users and 3,914 users respectively). Voice messages were both in the official language Portuguese (spoken mostly in urban areas) and the three most widely spoken local languages Macua

(spoken mostly in North of country), Sena (spoken extensively in the Center region) and Changana (spoken in the south). Written (SMS and USSD) messages were only in Portuguese.

68,708 people interacted with the 321 platform throughout the project. Unsurprisingly, in both the 2016/17 and 2017/18 seasons 321 usage was highest from December to March, the peak farming season, during which time the 321 content focused on land preparation, planting and some pest management - which suggests that new production-related information needs to be made available by December at the latest if farmers are to be able to fully take advantage of it. This also suggests the need to strengthen the off-season information content, such as

**Success story: the 321 platform's response to the 2017  
"pigeon pea crisis"**

In 2017 the previously extremely buoyant pigeon pea market to India suddenly and unexpectedly collapsed due to a bumper crop in India. As a result, the Mozambican farmgate price fell so low that many smallholders, left without a market, reportedly left it to rot in their fields. As a result, when the Content Committee convened to create the messages for the December 2017 batch of GAP related information its members designated much time to discussing the most appropriate messaging for pigeon pea farmers. The pigeon pea GAP content which was subsequently disseminated by the 321 platform contained vital information which was designed to help farmers make the most informed decisions regarding issues such as: what they should do with any pigeon pea stock that they still had, what to expect in terms of prices and whether or not they should grow pigeon pea for the next campaign (bearing in mind that pigeon pea is not only a potential cash crop but also an excellent nitrogen fixer, windbreak and hardy annual crop important for food security).

non-production information regarding prices, markets, standards, input acquisition and access to finance in preparation for the next agricultural year, in addition to production-related material for off season crops such as horticultural crops.

The most popular topic on the 321 platform (for both men and women) was maize, followed by cassava and agricultural price information (with 35,867, 11,745 and 10,231 interactions respectively). This suggest that there is a higher interest on information regarding staple crops (maize, cassava) which are the main source of farmers' livelihoods. Interestingly, the results indicate a strong demand for price information, signaling that in general farmers are market focused and producing for markets.

321 interaction data from Vodacom shows that the number of farmers accessing each topic tended to decrease over time, with the highest volume of interactions in Year 1. For information relating to cassava, for instance, Year One (2016/17) shows the highest number of users (6,495 people) engaging with the system - despite the project's main marketing efforts had not yet begun and in Year One and nor was it a full 12 months. Years Two and Three showed a decreasing trend to 4,132 users and 1,118 users respectively (Table 3). (Although Year 3 was also incomplete - with the project ending in February 2019 - the results available suggest that the number of users in Year Three would have been less than Year Two even if it had been a complete calendar year). The trend of decreasing users is concerning and merits further investigation. It could indicate, for instance, that farmers were dissatisfied with

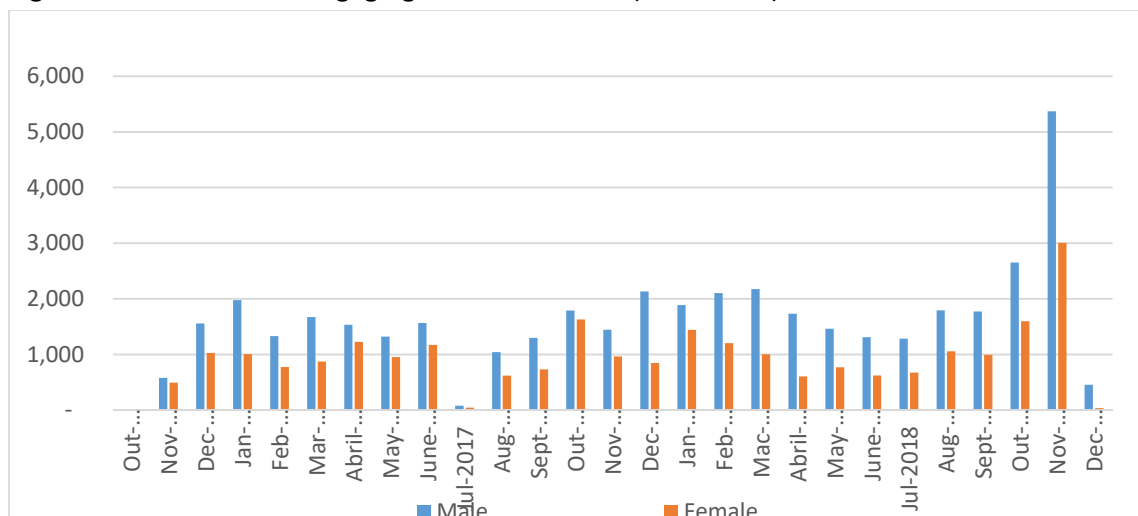
the service received, or that once they have accessed information, they see no need to return to the topic again, or that the platform was failing to attract new users. Either way, this points to the need to conduct regular client surveys to calculate the number of new versus existing users and to assess clients' levels of satisfaction with the services, with a view to understanding what motivates them to continually engage with the platform – for instance, by constantly refreshing information and targeting new users.

Table 3. No of farmers engaging with 321-platform by subtopic and per year

Subtopic	Season 2016/17	Season 2017/18	Season 2018/2019	Total (Cumulative)		
				Total	H	M
1 Maize	12,017	18,157	5,693	35,867	22,710	13,157
2 Cassava	6,495	4,132	1,118	11,745	7,304	4,441
3 Agricultural prices	2,625	4,972	2,634	10,231	6,774	3,457
4 Soya bean	3,667	1,693	791	6,151	3,469	2,682
5 Jobaid Extension	1,240	2,828	758	4,826	3,076	1,750
6 Orage fleshed sweet potato	-	3,285	1,001	4,286	2,607	1,679
7 Fall Army Worm	-	2,715	413	3,128	2,076	1,052
8 Resilient agric.	-	2,051	766	2,817	1,765	1,052
9 Rice	-	-	1,755	1,755	1,118	637
10 Aflatoxin	-	1,294	174	1,468	937	531
11 Pigeon pea	-	985	430	1,415	898	517
12 Spinach	-	843	153	996	605	391
13 Groundnut	-	605	355	960	646	314
14 Tomato	-	658	265	923	629	294
15 Cabbage	-	563	161	724	442	282
16 Banana	-	-	344	344	196	148
17 Sesame	-	-	324	324	197	127
18 Sugar bean	-	-	194	194	122	72
19 Cashew	-	-	185	185	121	64
20 Papaia	-	-	121	121	83	38
21 Agri. goods and services	-	2,479	2,781	5,260		
<b>Total</b>				<b>68,708</b>	<b>43,334</b>	<b>25,374</b>

Compared to the previous two years, the 2018/19 campaign saw a sudden spike in the number of users accessing the 321 system during the months of October and November (see Figure 2 below). This is difficult to explain, but the most likely cause was the project's high investment in promotional activities such as roadshows and events around this time in certain districts of Nampula, Zambézia, Manica and Sofala provinces (discussed in 2.4 below), during which users interacted considerably with the project team face to face. If correct, this explanation would suggest that personal interaction with platform/project staff is an important marketing tool, and ICT systems can be enhanced by combining them with traditional extension models. See *lessons learned*, below.

Figure 2. No. of farmers engaging with 321-service (2016-2018)



### Women’s use of the use of the 321 system

Overall the 321 platform achieved a good gender balance - 37% of all 321 platform users (68,708) were women. Women generally accounted for between 32% and 40% of total users per topic, with soya and banana being the only two information lines which stood out as being significantly more popular with women (at 44% and 43% of users respectively – see Table 3 above). The slightly uneven spread between male and female 321 platform users was unsurprising given what we know about the technology gender gap and women’s reduced use of mobile phones compared to men (data from Manica, Nampula and Zambézia provinces, for instance, shows that women are 22% less likely to use a mobile phone as men).<sup>2</sup> As will be discussed in section 2.2.4 below, the gender divide was more evident for the 321 platform than for community radio due to the fact that cellphones require a higher degree of literacy (including technological literacy - with women being less confident in using cellphones for anything other than calls and SMS, for instance), cellphones are often owned and/or controlled by men, and radio is seen by many communities to be a more “female friendly” device often accessed by women while undertaking other household chores.

### 321 platform users per region

Table 4 below shows the number of 321 platform users per region. There were relatively more users engaging with the system from the north, followed by center and southern regions (with 27,561, 22,286 and 18,861 users respectively). This makes sense since, although the 321-service was made available for all Vodacom subscribers nationwide, the intensive marketing campaigns only took place in the main project intervention geographical areas in the north and center regions (or Nacala and Beira corridors). Interestingly, it was Manica and Zambézia provinces (in the center and north-west of the country respectively) where the project was able to leverage the most support from other NCBA CLUSA managed projects such as field days and extension teams, yet by far the highest number of users (over 17,000) were located

<sup>2</sup> Mobile Solutions Technical Assistance and Research (mSTAR) project (2016).



in Nampula province where the project was not able to leverage other NCBA CLUSA support. Similar to the peak of users in October and November 2018, this may be a result of the investment in project roadshows and face to face contact with project staff, which were more intensive in Nampula province than Manica and Zambézia (Figure 7).

Table 4. Number 321-service users per region

Region	Total unique users		
	Total	Men	Women
<b>South</b>			
Maputo City	4,002	2,406	1,596
Maputo greater area	7,030	4,081	2,949
Inhambane	5,156	3,217	1,939
Gaza	2,673	1,627	1,046
Subtotal	18,861	11,331	7,530
<b>Center</b>			
Manica	7,693	5,376	2,317
Tete	6,866	4,524	2,342
Sofala	6,264	4,523	1,741
Zambezia	1,463	839	624
Subtotal	22,286	15,262	7,024
<b>North</b>			
Nampula	17,271	11,603	5,668
Cabo Delgado	7,193	3,371	3,822
Niassa	3,097	1,767	1,330
Subtotal	27,561	16,741	10,820
<b>Total</b>	<b>68,708</b>	<b>43,334</b>	<b>25,374</b>

### 2.1.1 Dynamic information (agricultural prices and goods/services) updated on the 321 platform

In addition to the 321-platform content related to the GAPs the project also introduced more dynamic information, updated every two weeks, via SMS and USSD. This consisted of farm gate commodity prices information, which was sourced from the national Agriculture Market Information System (SIMA), a Government body (part of the Department of Statistics) from which NCBA CLUSA had formal approval for the use of data. SIMA provided price information for maize, cowpea, groundnut, cassava, sweet potato and sugar bean for the main markets in the southern, northern and center regions.

In addition to price information, the project engaged with 27 organizations to support them to use the 321 platform as a marketing platform for their goods and services such as inputs (e.g. seeds, chemicals, etc.), agricultural services (e.g. commodity processing services, tractor services), new technologies (e.g. hermetic storage bags), financial products and off-take purchase (see Table 5). While the vast majority of these were private companies, some nonprofit organizations also showed an interest in using the platform for their own information purposes – for instance, the USAID funded SEMEAR project. During the initial phase of the project, staff found it difficult to entice the private sector to engage with the 321 platform - largely due to the firms' capacities in terms of time and staff, with many staff

requiring intensive support and encouragement from project staff in developing and updating their messages. However, once the systems had been set up most of the 27 organizations were able to prepare and update their own messages and engaged willingly with the platform - showing enthusiasm for the service once they had seen the value proposition.

Table 5. Organizations promoting their products and services through the 321 platform

ID	Organization	Size of the business	Category (service/product)
1	Buenzi-Ya Alime	Micro	Output buyer
2	K2	Small	Input supplier
3	Agrodalton	Micro	Input supplier
4	COPEPAMO	Micro	Output buyer
5	Agri Insumos	Small	Input supplier
6	ADECOZA,	Micro	Input supplier
7	Comp.Zambe,	Small	Input supplier
8	GAPI	Large	Finance service
9	Ribaue Mechanization Services	Small	Mechanization services
10	Oruwera	Small	Input supplier
11	Phoenix Seeds	Small	Input supplier
12	JNB	Micro	Input supplier
13	IKURU	Small	Output buyer
14	AMPCM	Small	Output buyer
15	Matharya impre.	Small	Output buyer
16	SEMEAR	Small	Input supplier
17	AIPM	Small	Output & mechanization service
18	BUENZI-YA-ALIME	Small	Output buyer
19	AGRO-SIKADZA	Small	Processing services, output buyer
20	Opportunity Bank	Large	Finance service
21	Pannar Seeds	Large	Input supplier
22	Victor Gaspar	Micro	Input suppliers, Output buyers
23	RC Services	Micro	Input suppliers/beekeeping
24	BNI	Large	Finance services (National Bank)
25	AGROWAN	Micro	Output buyers
26	Kickstart	Large	Input suppliers/ Irrigation kits
27	NAKOSSO	Medium	Input suppliers/ Agrobusiness fairs

Table 6 below shows the most accessed categories of products and services which were input and technology providers and output markets, with Ikuru (input and output buyer) and the Ribaué Mechanized Service Centre (mechanization service provider as well as output buyer) registering 547 and 462 unique users respectively. One of the main advantages of including private sector suppliers of goods and services was that it kept the information market focused and timely – in other words, it minimized the risk of the platform promoting technologies, crops and services which were not actually available on the ground at the time.

Table 6. Farmers accessing 321 information regarding suppliers of goods and services

	Input suppliers	Total
1	Ikuru	575
2	Agrifocus	200
3	ORUWERA	195
4	Phoenix Seeds	125
5	K2	107
6	Agri Insumos	73
7	SEMEAR	62

8	JNB	55
9	AgroDalton	50
10	Matharia	48
11	CIP-VISTA	44
12	ADECOZA	33
13	RC Services	30
14	Pannar Seeds	26
15	Victor Gaspar	16
<b>Financial Services</b>		
16	GAPI AgroJoven	841
17	Opportunity Bank	195
18	GAPI Agro-Garante	180
19	GAPI Agro-Emprender	138
20	BNI	106
<b>Mechanization services</b>		
21	Ikuru	687
22	Ribaue Mechanized Service Centre	247
23	AIPM	100
<b>Crop processing</b>		
24	Ikuru	1,068
25	COPEPAMO	104
<b>Output buyers</b>		
26	Ikuru	408
27	Ribaue Mechanized Service Centre	473
28	Matharia Empreend.	152
29	AMPCM	121
30	Victor Gaspar	107
31	AGRO-SIKADZA	84
32	COPEPAMO	41
33	BUENZI-YA-ALIME	41
34	AIMP	34
<b>Total</b>		<b>5,260</b>

### *Potential applications as a Market Information System (MIS)*

Due to constraints on time, resources and scope it was not possible to create any formal data collection or feedback mechanisms to measure the impact of marketing services on company sales. Nor was it possible to take full advantage of the user data that was harvested (e.g. locations of users, user preferences, etc.) and attractively “package” this for sale to third parties (indeed, with the most popular company receiving only 547 “hits” the service had yet to harvest sufficient data for such a service at this stage). Yet the potential for offering digital market information services (or Market Information System - MIS) probably represents the most likely avenue for ensuring the sustainability of the ICT platforms promoted by the project, since it can enable ICT platforms (whether cellphone or radio, or a combination of the two technologies) to provide a range of market information services - such as monthly dashboards, off air digital services, mobile alerts via SMS/IVR messages and the provision of bundles of targeted SMS and push messaging - which can serve as additional revenue streams that sustain their activities. Conversations with large players such as ETG and Yara Fertilizers, for instance, indicate that there is a high demand for the kind of market information that digital cellphone and radio platforms can now quickly and cheaply generate, often with relatively lost cost or even open source technologies (e.g. Farm Radio International’s Green

Leaf Digital Platform, or FrontLine SMS - an open sourced software - both of which combine community radio with cellphone and online services). This is particularly the case for rural areas for which little market information is known regarding client demographics and marketing metrics, and many firms (particularly multinationals who despite their size have little understanding of the local context) are often reluctant to establish a footprint without first understanding the context in which they will be working.

Clearly, establishing an advanced business orientated digital MIS was far beyond the scope of this project. The project did, however, show that there is potential demand for such services in Mozambique. Steps have already been taken in this direction by the Kugalissa initiative based in Manica province (an AGRA funded initiative implemented by a consortium comprised of the NGO ADEM, the Micaia Foundation and the Provincial Union of Smallholder Farmers of Tete). One of the most sustainable solutions for providing market services, however, would involve the expertise of a specialist for-profit organization. This has already happened in Zambia, where the company Lima Links (<http://www.limalinkszambia.com/>) runs a 100% self-financed Market Information System and marketing platform, complete with bundled financial services, with 70,000 registered smallholders. Note that through various meetings and communications with the project, Lima Links has shown a strong interest in establishing itself in Mozambique in the future.

## **2.2 Support and training given to radio stations**

Using the Farm Radio International methodology, the project signed a four to six-month partnership with five community radio stations - Ribaue, Alto Molocue, Namialo, Angonia and Macequece - and provided in-station training to 35 of their radio officers in order to strengthen their capacity to broadcast high quality farm radio episodes. The training focused on:

- Use of ULIZA system (an online platform that helps broadcasters to interact with their listeners via voice and phone text) and the FRI log (for interaction with FRI technical team on monitoring and archiving programs).
- The use of software (Adobe Audition) for program editing. The project provided this software to each of the five stations, together with other equipment (see Table 7 below).
- Good interview practices and gender balanced radio production.

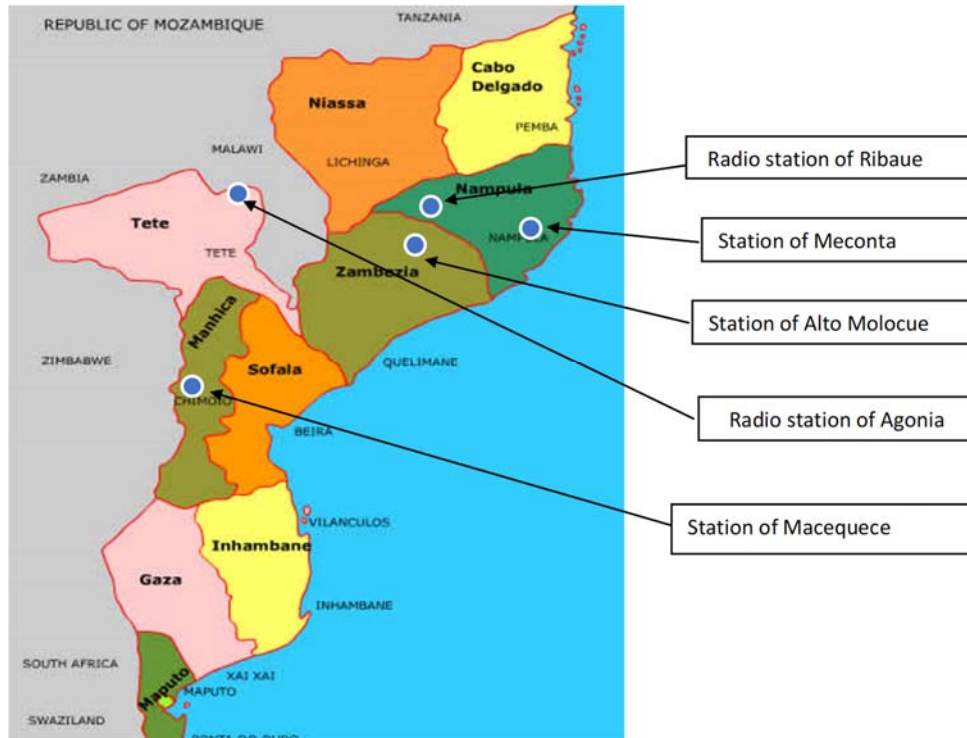


Figure 3. Locations of project supported community radio stations

The project also supplied and installed radio equipment (figure 4) to the five stations in the form of a grant (Table 7) and trained radio staff in its use/maintenance.

Table 7. Number of radio technicians trained and equipped

Station	No. of trained officers	Equipment and material provided
Ribaue	5	<ul style="list-style-type: none"> <li>▪ HP Desktop</li> <li>▪ Sony recorder</li> <li>▪ Tablet and UPS</li> </ul>
Alto Molocue	6	<ul style="list-style-type: none"> <li>▪ HP Desktop</li> <li>▪ Sony recorder</li> <li>▪ Cell phone</li> </ul>
Angonia	5	<ul style="list-style-type: none"> <li>▪ HP Desktop</li> <li>▪ SONY Recorder</li> <li>▪ Movitel Modems</li> </ul>
Macequece	10	<ul style="list-style-type: none"> <li>▪ HP Desktop &amp;UPS</li> <li>▪ SONY Recorder</li> </ul>
Namialo	10	<ul style="list-style-type: none"> <li>▪ Sony Recorder, cellphone and battery</li> </ul>
<b>Total</b>	<b>35</b>	

### 2.2.1 Interactive radio programs broadcasted

The project supported the five community radio stations to produce and air interactive radio programs with agricultural content. The selected crops and GAPs were determined according to each area's agronomic characteristics and needs, and covered a range of value chains (maize, cassava, groundnuts, common beans, soybean, pigeon pea and cowpea), with all techniques aligned with resilient agriculture practices. 226 live programs were broadcast, with 186 episodes repeated. Episodes were broadcast in Portuguese and local languages, including Macua (Ribaue and Meconta), Lomue (Alto Molocue), Nyanja (Angonia). Table 8 below indicates the breakdown of the five community radio stations.

The project found that many community radio stations lacked the relatively basic infrastructure necessary for uninterrupted broadcasting. Mostly, these were related to electrical and other technical problems - particularly Angonia radio station which suffered so many interruptions to its electricity supply between December to February 2018 that



Figure 4. Radio officers trained and material provided to Ribaue radio station.

it was only able to broadcast 20 out of 48 new episodes. In order to compensate for this, the project leveraged support from the USAID funded RAMA Beira Corridor project (for which NCBA CLUSA was a sub to Land O' Lakes) to work with a further five stations in Catandica, Sussundenga (Manica province), Macanga, Tshangano and Mossurize (Tete province) by adapting the materials and content used by Angonia and Macequece radio stations to the new stations' needs, conditions and languages (Xibaurue, Chimanica, Nyanja and Shona). By doing so, project was able to support radio stations to air a further 75 episodes (Table 8.1).

Table 8. Breakdown of community radio stations' agricultural radio programs

Station	Day of broadcast	Time of broadcast	Language	No. of live broadcasts (plan)	No. of live broadcasts (actual)	Day of repeat broadcast	No. of repeat broadcasts	Time of repeat
Ribaue	Thursday	01:10 to 01:45 p.m.	Portuguese	28	22	Saturday	22	01:10 01:45 p.m.
		04:10 to 04:50 p.m.	Emacua	28	22		22	04:10 to 04:50 p.m.
Alto Molocue	Thursday	01.30 to 02.00 p.m.	Portuguese	13	13	Saturday	13	08.30 to 09:00 p.m.
		03.10 to 03.40 p.m.	Lomue	13	13		13	03.10 to 03.40 p.m.
Angónia	Tuesday	06.00 to 06:40 p.m.	Portuguese	24	10	Sunday	10	06:00 to 06:40 p.m.
		02:30 to 03:10 p.m.	Nyanja	24	10		10	02:30 to 03:10 p.m.
Macequece	Tuesday	04:10 to 04:40 p.m.	Portuguese	24	24	Saturday	24	04.10 to 04:40 p.m.
		05:30 to 06:00 p.m.	Chimanhica	24	24		24	02:10 to 02:40 p.m.
Namialo	Monday	02:05 to 02:50 p.m.	Macua	24	24	Friday	24	02:05 to 02:50 p.m.
	Tuesday	02:05 to 02:50 p.m.	Portuguese	24	24	Saturday	24	02:05 to 02:50 p.m.
<b>Total</b>				<b>226</b>	<b>186</b>		<b>186</b>	

Table 8.1 Radio programs in other stations using content developed for Angonia, Macequece stations

Station	Day of broadcast	Time of broadcast	Language	No. of live broadcasts
Catandica	Friday	01:00 to 01:40 p.m.	Xibaure	15
	Tuesday			
Macanga	Wednesday	07:00 to 07:40 pm	Nyanja	15
	Friday	10:00 to 10:40 pm		
Sussundenga	Monday	05:10 to 05:50 pm	Chimanica	15
	Friday			
Tsangano	Friday	10:00 to 10:40 am	Nyanja	15
	Tuesday			
Mossurize	Monday	02:00 to 03:30 pm	Shona	15
	Wednesday			
<b>Total</b>				<b>75</b>

## 2.2.2 Community Listeners Groups (CLGs)

In order to engage as much as possible with communities and listeners, the project introduced feedback mechanisms in the form of Community Listener Groups (CLGs). CLGs (Figure 5) are groups of listeners who meet weekly to listen to radio programs in groups, discuss what they have heard and then interact with radio station staff to give feedback, ask questions, air their opinions and actively participate in the development of radio program content. Various mechanisms exist for them to interact with radio stations, two of which – the use of Farm Radio International’s digital ULIZA platform and freephone telephone numbers – were promoted by the project (see below). With project support, 25 CLGs were formed with 588 participants (284 women and 304 men – see Table 9).

Table 9. CLGs per community radio station supported by the project

Province	Radio station	Post Administrative	N.of CLGs	# of participants		
				Female	Male	Total
Nampula	Ribaue	Iapala	Ehikite	8	9	17
			Inlema	16	14	30
		Ribaue-Sede	Olima Ovilela	61	111	172
Nampula	Meconta	Meconta	Teterrene	14	8	22
		Namialo	Vieira	8	21	29
		Namialo	J. Chissano	8	9	17
		Nakololo	Nakololo	9	8	17
		Netia	Netia	9	6	15
Alto Molocue	Nauela	Novanana	Mohiua	15	15	30
			Lugela	12	7	18
			Muhitxo	11	5	16
			Napacala	9	6	15
			Novanana	13	4	17
Tete	Angónia	Ulongué	Rugula	15	8	23
			Chindeque	8	7	15

			Ndundo	10	5	15
			Katsanha	6	9	15
			Micolongo	7	8	15
			Macuanguala	8	7	15
Manica	Manica	Mavonde	Chitunga	4	11	15
		Messica	Chinhambuzi	10	5	15
		Manica	Chitewe	12	3	15
		Machipanda	Shazuka	4	11	15
		Mavonde	Dororo	7	8	15
<b>Total</b>				<b>284</b>	<b>305</b>	<b>588</b>

### 2.2.3 Radio audience's interactivity with the ULIZA platform

Central to enabling CLGs to interact with the community radios was the FRI managed ULIZA platform – an interactive digital platform which enables radio listeners to engage with radio stations by calling a free number, answer questions with the use of the phone keyboard, leave recorded messages, provide feedback on what they have heard and hear their own voices played back on the radio (very popular with many listeners). ULIZA also has a range of other functions including ULIZA info (questions/answers), ULIZA Alert (push messages), ULIZA Info (pull content) and ULIZA Poll (interaction through voting) which enable radio stations to collect listener feedback. The project supported CLG listeners to use the platform to interact with radio stations using ULIZA. This feedback was then used by the radio station to better plan future radio programs.



Figure 5. Community Listening Group, Alto Molocue district

However, the project experienced some teething problems with ULIZA relating to the fact that, with ULIZA being a new system, CLG members required intensive support from project staff in order to experiment. As a result, only 1,335 (818 male and 498 female) of radio program listeners interacted with radio programs via ULIZA (Table 9), which accounts for less than 1% of the total listeners (439,972). Additionally, ULIZA's costs made it unsustainable for most community radios – radio stations pay according to the number of interactions therefore for radios with a high level of interaction the costs began to escalate (ULIZA cost Alto Molocue community radio around USD100 per week, for instance). This suggests that in order to make such audience feedback mechanisms such as ULIZA sustainable they will need to be linked with revenue streams for radio stations (e.g. use by taking advantage of ULIZA's other services such as ULIZA poll and offering these to third parties).



Table 10. Total number of interactions on ULIZA platform

Radio station	Male	Female	Total
	Number of interactions		
Ribaue	277	150	427
AltoMolocue	800	511	1,311
Angonia	17	24	41
Manica	148	135	283
Meconta	194	119	313
<b>Total</b>	<b>1,271</b>	<b>915</b>	<b>2,334</b>
	Unique users		
Ribaue	153	132	285
AltoMolocue	373	200	573
Angonia	14	15	29
Manica	144	98	242
Meconta	148	68	206
<b>Total</b>	<b>818</b>	<b>498</b>	<b>1,335</b>

#### **2.2.4 Women’s use of community radios**

The project achieved a very strong gender balance for community radio, with 49% of radio program listeners being women (as mentioned above, this compared with 37% of 321 platform users being women – which was a reasonable gender balance). The project took a variety of measures to encourage that women listened to and engage with community radio programs, which included:

- Leveraging significant support from NCBA CLUSA Promac II extension staff. Promac II has a strong gender focus - 40% of its extension staff and 55% of its Lead Farmers are women. The project used this network to promote community radio programs in the districts in which it overlapped with Promac II.
- Promoting engagement with women and gender sensitive programming through Community Listening Groups (CLGs). Nearly 50% of total CLG members were women.
- Conducting formative research for radio programs that involved interviewing women separately from men (in order to gauge their interests and needs in terms of community radio content and programming).
- Providing additional one on one assistance to female members of CLGs in order to encourage and enable them to engage with community radio stations through the ULIZA platform.
- Creating radio program topics that were more relevant for female listeners. For instance, formative research and CLGs showed that women were interested in information related to cooking, such as the correct time to remove cassava leaves to use them in their meals.

- Adjusting the time and day of airing were adjusted to the needs of women – for instance, most programs were scheduled for the afternoon when women had more free time to listen (with their mornings mostly taken up with taking care of children and sending them to school, preparing meals, farm work and chores).

### **2.3 Video “job aid” production and screening**

In order to reinforce extension workers’ capacity to deliver extension services to smallholder farmers, the project produced audio-visual (or “job aid”) material in the form of videos. The original intention was that these videos would be disseminated to extension staff in the form of visual job aids that could be downloaded by extension staff from a Vodacom toll-free website **321online.org** (a URL channel) and used to complement their work by increasing their own job knowledge and supporting conversation with farmers. However, for reasons which were not made clear to the project, Vodacom was unwilling to provide this toll-free service, meaning that the project needed to find an alternative method of disseminating videos to extension staff and, potentially, a wider audience also.



#### **Feeling Postive about Farmers’ Hour**

Alto Molocue radio’s listeners are positive about the changes that Farmers’ Hour has brought about. “I’ve lived in this community for many years and this is the first time that we’ve ever had radio programs like this” said **Victorina Vasco**, 42, a smallholder farmer and member of Soares Listening Group. “Farmers’ Hour has really helped farmers here. Before, we just planted cassava sticks without following any real guidelines. Now, we know that there is a correct time and method to do this. For instance, we know how to prepare the cassava sticks for planting, and how to disinfect the knife used to cut the sticks, and if we don’t have access to the proper products, we know how to make do with local products such as ashes and soap. Before the program we also used to take the leaves off at any time to put in our meals, but now we know that there’s a correct time to do this.” said Victorina. . Asked how she is able to relay her needs back to the radio station, she adds that “we listen to Farmers’ Hour every Thursday. We listen as a group and afterwards share our experiences amongst ourselves. If we have any doubts or questions, we call the Uliza number and the radio technicians the following week. This way we know that we are listening to the radio station, but they are also listening to us”.

The project took the decision to create instructional videos and disseminate them in rural communities via solar powered television screens. A specialist media production company based in Nampula was contracted to produce the first two videos and train two project staff in video production – enabling subsequent videos to be produced in-house. The themes were selected in collaboration with SSTP subgrantees and other NCBA CLUSA projects such as PROMAC II, which ensured that they were aligned with NCBA CLUSA promoted climate smart and resilient agriculture techniques. The videos demonstrated the following GAPs:

- The use of conservation agriculture principles
- Preparation of cassava planting material and planting
- Use of certified seed and varieties
- Use of driers for groundnuts
- The Fall Army Worm (in maize) and its control methods
- Grain conservation with the use atelic.<sup>3</sup>

To ensure that the videos were disseminated as widely as possible, the project purchased solar powered video screens which were mounted in selected NCBA CLUSA supported agrodealers' stores. The screens were used in two ways: 1) by disseminating videos to agrodealers' clients when they visited the store, and 2) by borrowing them from agrodealers, the screens were used to train smallholders through project organized collective

video screenings in community locations (Figure 6), leveraging the support from other NCBA CLUSA project extensions staff (e.g. PROMAC II and the World Bank funded PAFF project (*Projecto Amiga da Floresta*), in addition to local government extension officers, who organized the farmers in groups at the designated locations. Each video screening was followed by a structured discussion and question and answer session led by project and Government extension staff.



Figure 6. Community video screenings (Community video screening in Ehikiti, Ribaué district, Nampula province)

The project screened videos to 778 farmers (male 430, female 348), as shown in Table 11. An additional 1,240 people also watched videos through agrodealers' stores (Figure 6 and Table 12), although the actual number was probably much higher than this since some agrodealers did not fully record the names of all the individuals who viewed the videos.

<sup>3</sup> The videos can be viewed on NCBA CLUSA Mozambique's YouTube channel, which can be accessed on the following link: <https://www.youtube.com/channel/UCwHKAanlt7J7dde6yh4AWEQ>

Table 11. Number of farmers participating in community video screenings

District/Community	Men	Women	Total
Alto Molócuè	102	84	186
Molócuè Sede	102	84	186
Ile	114	97	211
Ile Sede	65	41	106
Mugulama	13	4	17
Nipiode	36	52	88
Meconta	139	133	272
Meconta sede	126	116	242
Namialo	13	17	30
Monapo	9	4	13
Netia	9	4	13
Ribáuè	66	30	96
Iapala	28	18	46
Ribáuè Sede	38	12	50
<b>Grand total</b>	<b>430</b>	<b>348</b>	<b>778</b>

Table 12. Number of farmers who watched videos through TV screens in agrodealers' stores

Name of agrodealer	Province	District	# people	Male	Female
Helder Jorge	Nampula	Ribáué	160	145	15
Amilcar Cuacheque (Agrodalton)	Nampula	Malema	119	106	13
Faustino Felizardo Luanda	Zambézia	Molumbo	161	109	52
Tongai Canurai	Zambézia	Gurue	187	122	65
Ismail Zacarias	Manica	Vanduzi	212	153	59
Naome Elias Chazuca	Manica	Chinhamachovi	131	98	33
Zacarias Chamuada	Manica	Messica	270	183	87
<b>TOTAL</b>			<b>1,240</b>	<b>916</b>	<b>324</b>

Despite not being a planned activity, the instructional videos had a positive impact on the adoption of improved practices by the farmers who viewed them. By organizing community viewings and placing screens at agrodealers' stores, rather than directly targeting only extension staff via the toll-free webpage, the project managed to reach farmers immediately and directly. For instance, the Quarter Two (2017/18 season) survey showed that out of a group of 162 farmers who watched the video on conservation agriculture (CA) principles, 116 (nearly 70%) of them applied CA during land preparation in that season. When asked to what extent the video had influenced their application of the conservation agriculture techniques, 33% of them explained that if they had not watched the video, they would not have used CA at all. The remaining 67% of farmers stated that the video helped them to better apply CA. In addition, another surprise benefit of this deviation from the original work plan was that it enabled the project to experiment with another potentially sustainable route for ICT enabled extension services - the use of the private sector's agrodealer or agent network for

disseminating GAPs. By providing technical support to local inputs companies - such as Oruwera Seed Company and Phoenix Seeds - to produce videos and disseminate them to their agrodealer networks, Multimedia Extension showed that the promotion of GAPs can potentially be sustainable when embedded within the local market system.

#### **2.4 Marketing the ICT enabled services**

To stimulate demand for the ICT enabled services the project invested heavily in low cost but high impact marketing activities which targeted smallholders. Radio spots were one such cost-effective marketing method. Spots were broadcasted by the five radio stations supported by the project. In addition, the project paid for advertising space on other ten community radio stations within its intervention area. Spots were one to three minutes in length and used local languages (e.g. Macua, Lomue, Chimahica, Xibaurue, Chimanica, Nyanja, Shona) as well as Portuguese to inform listeners of how to access the 321 Service and to how to participate in the radio programs (where applicable).

The project also produced posters, pamphlets and instruction cards. These were directly distributed to smallholder farmers and stakeholders during roadshows and other events. Roadshows were organized by project staff, together with community leaders, which involved project staff passing through busy community locations with a loud speaker, music and promotional materials. The project selected locations with a high concentration of people, including community fairs, local markets during weekly market days and events organized by other agricultural stakeholders (input providers and output buyers, NGOs and local authorities), as shown in Figure 6. Farmers were found to respond well to roadshows and demonstrations, appreciating the face to face contact with field staff. This was particularly the case with farmers in parts of Nampula province, where in some cases it was observed that the less commercially minded farmers were reluctant to use the services unless their communities were actually visited by the project team on a regular basis and had the ICT services demonstrated to them, in person, by the project team. This may be because those districts have become more saturated with NGO activities for over the last two decades and farmers have become accustomed to receiving regular and direct contact from project field staff.

Again, this shows the importance of enhancing traditional extension services with the use of ICT enabled services. The project was able to maximize its ability to do this by leveraging support from the field staff and smallholder farmer network of other NCBA CLUSA projects - for instance the RAMA (Beira corridor) Portucel (Ile and Namaroi Districts of Zambézia Province), the World Bank/IFC funded PAAF project (Zambézia Province), and PROMAC II (Zambézia and Manica Provinces) projects. In all of these cases, NCBA CLUSA's extension model of informal farmer groups of around 30 smallholders, each organized around a Lead Farmer, was a key resource for MultiMedia. This enabled NCBA CLUSA field staff to market the 321 services to a large number of farmers at one time, demonstrating how to access them (in particular, how to navigate their way around the 321 platform via their cellphones) and mobilizing farmers to participate in community events (e.g. community video screenings). It

also enabled field staff to support farmers to practice the new technologies learned through the ICT channels, reinforcing what they had learned through the ICT channels via and complimentary, face to face, extension support. This could be one of the main reasons behind the project’s very high conversion rate from *accessing* the ICT services to actually *applying* the practices (see 4.1.3 below).



Figure 7. 321-Service Promotional campaign in the rural communities

In addition to audio-visual marketing techniques, the project sent a “push” SMS alert to the all users of the 321-agriculture platform to inform them of the existence of new agricultural content. This was observed to be an effective method of encouraging farmers to engage with the service - for instance, a survey conducted in February 2018 to assess the impact of SMS alert sent to inform about information regarding the Fall Army Worm showed that number of beneficiaries increased after the SMS alert day (figure 8).

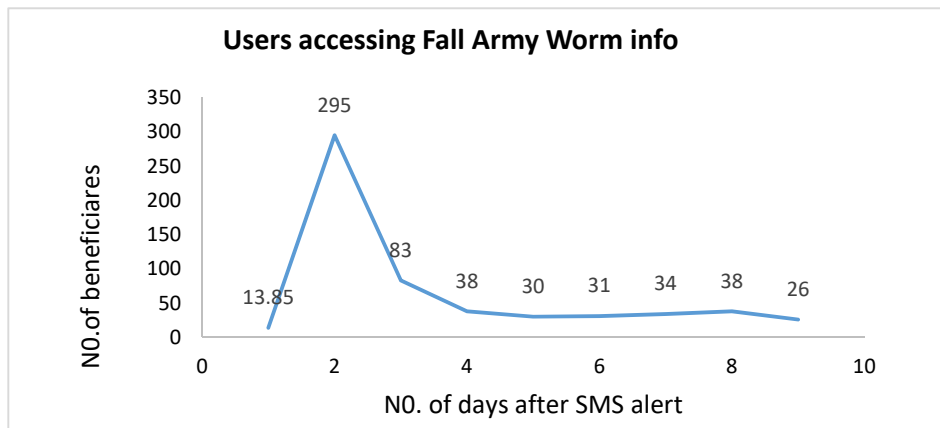


Figure 8. Number of beneficiaries engaging with 321 after SMS alert

### **3. Summary of collaboration with other new alliance stakeholders and how activities were consistent with the SSTP road map**

#### **3.1 Collaboration with Scaling Seeds and Technology Partnership (SSTP) program**

Since SSTP promoted crops and technologies formed the focus of the information broadcasted through the ICT channels, it was crucial that all project activities were consistently aligned with SSTP and its subgrantees' interests. To ensure this, SSTP and subgrantees actively participated in the selection, preparation and broadcasting of the promoted agricultural information for the interactive radio programs, the 321 platform and the instructional videos. For instance:

- SSTP and its grantees - Oruwera, IIAM, IFDC and Companhia do Zembe – were members of the project's Content Committee. This ensured that the 321 GAP related, and other messages were aligned with SSTP priorities and promoted technologies.
- The SSTP subgrantees assisted in the production of videos – for instance, IIAM was actively engaged in the preparation of videos related to cassava planting methods, the use of improved varieties/certified seeds and methods to control the Fall Army Worm pest, while Oruwera contributed to the improved varieties/certified seed video.
- SSTP and its grantees were involved in designing and disseminating farm radio episodes, identifying the radio episodes formats most adequate to each topic and identifying the key experts for interviews and debates. In some cases SSTP grantees were also part of the expertise panel.

#### **3.2 Collaboration with other partners**

The project signed an internal partnership with the RAMA Beira Corridor Project, which was also implementing activities with two of the same radio stations as Multimedia Extension (Angonia and Manica). Within this partnership, Multimedia Extension was responsible for training the radio station staff and providing them with equipment, whereas RAMA covered the cost of preparing and airing the episodes and, due to RAMA's physical presence in Beira Corridor, providing direct assistance to and monitoring of the radio programs. The Multimedia-RAMA partnership made it possible to expand the farm radio programs to other five additional radio stations (Catandica, Sussundenga, Macanga, Tshangano and Mossurize) located within the RAMA project area. Unfortunately, however, it was not possible to capture data regarding the actual outreach as the RAMA project was prematurely closed due to a reduction in funding.

### **4. Data on performance and impact indicators**

To assess impact of the interactive radio programs, a survey was conducted in each of the five districts in which the project supported community radios - Ribaue, Meconta, AltoMolocue, Angonia and Manica. Using an Excel computer-generated sampling method to randomly sample communities from within this universe, 993 radio listeners were interviewed in the

five districts (Table 13). It was estimated that total rural working age population within radio coverage area was 698,624 (Table 14).

Table 13. Estimate of population within radio station coverage area

Radio station	Population within radio coverage area	Total rural population within radio coverage area	Total rural working age population within radio coverage area
Ribaue	183,222	102,928	56,693
AltoMolocue	269,161	192,675	106,742
Angonia	816,474	707,582	392,000
Manica	541,702	172,439	95,531
Meconta	141,345	86,026	47,658
<b>Total</b>	<b>1,951,904</b>	<b>1,261,650</b>	<b>698,624</b>

Table 14. Number of farmers interviewed per district

Districts	Total number of farmers interviewed	Number of female farmers interviewed	Number of male farmers interviewed
Ribaue	253	131	122
AltoMolocue	380	195	185
Angonia	250	128	122
Manica	69	40	29
Meconta	41	20	21
<b>Total</b>	<b>993</b>	<b>514</b>	<b>479</b>

Data verification for each indicator was carried out as following:

- **Indicator 1.1 (number of farmers with access to one or more ICT channels):** the project assumed that 550,000 users, corresponding to 10% of the national Vodacom subscribers (6,000,000), would access to 321-service
- **Indicator 1.2 (number of people using the service):** data was captured from the HNI/Vodacom managed system which automatically logs all 321 users
- **Indicator 1.3 (the number of farmers applying technologies) and 1.4 (the number of hectares under promoted management practices):** the project used the results from the survey conducted in the project districts and extrapolated this to the entire farmers reached under 1.2 to give a result for the entire country (it should be noted, however, that the results from those districts are not necessarily representative of the whole country).

#### **4.1 Discussion on the project indicators and performance**

##### **4.1.1: Indicator 1.1 - Number of farmers with access to one or more ICT channels**

In total, 1,773,624 farmers had access to one or more ICT channels, constituting 192% of the project target (925,000), as shown in the Table 14 and Table 15. The overachievement in this was mostly contributed by radio programs, as discussed below:

##### *Radio Programs*



Over three years the project reached a potential radio audience of 698,624 farmers, equivalent to 186% of the target (375,000). This target was exceeded because the assumed potential audience of 75,000 for community radio stations, based on the FRI experience in the other countries, was relatively low compared with the actual average of potential listeners which was 139,725 (= 698,624/5). For instance, just one radio station alone (Angonia, with 392,000 potential listeners) exceeded the overall radio program project target.

#### *321 platform*

The project expected to make the 321 services available to 550,000 Vodacom subscribers, corresponding to 10% of the national Vodacom subscribers (the project assumed that around 10% of Vodacom subscribers were rural, and therefore the target market for the 321 agricultural content). Since the national statistics did not change, and the project did not have other means of verification for this indicator, a 100% achievement of this target was assumed.

#### **4.1.2: Indicator 1.2 - Number of farmers using ICT services**

490,478 smallholder farmers engaged with the ICT services during the project. This corresponds to 151% of the project target (325,500). The project was able to exceed its targets mainly due to the radio element, not the 321-component (as will be discussed below).

#### *Radio programs*

For many farmers radio programs are one of the main sources (or indeed are the only source) of extension services available locally. During the project implementation 439,972 farmers listened to one to two radio episodes, equivalent to 234% of the overall target (188,000). This was partly a result of the larger than expected potential radio audience (discussed above). More importantly, however, was the fact that a higher than expected percentage of potential listeners went on to listen to at least one episode - 63% of potential audience listened to at least one episode, versus an expected 50%. This is likely to be a result of the efforts made by the project, with its technical partner FRI, to produce radio content which was relevant, interesting and engaging for the target audience.

#### *321-Service*

The 321-system registered 68,708 unique users (37% of which were women). This corresponds to 50% of total project target (137,500). The project had assumed that 25% of those with access to the 321 platform (or rather, 25% of 550,000 -- the total rural Vodacom subscribers) would go on to use it; yet using this figure of 550,000 rural Vodacom subscribers we can calculate that only 12.5% of those subscribers actually did so.

However, this apparent under achievement was probably due to an overestimation of the number of rural people with access to the 321 platform, which led to an inflated target for this indicator (assuming 25% of Vodacom subscribers would access the platform). Field data from the households interviewed in the 2017 and 2018 project surveys in the districts of Alto Molocue (Zambezia province), Ribaué, Meconta (Nampula province) and Manica and Macequece (Manica province) suggests that on average 25% of the potential Vodacom users

in these five districts did actually access the services, and thus the project would have reached its target based on the actual findings in the field. Possibly the overestimation of Vodacom's rural subscribers is since the company's limited network coverage in rural communities gives it a very uneven urban-rural split, with fewer people using this mobile provider in rural communities than was assumed at the project design stage.

#### **4.1.3: Indicator 1.3 - Number of farmers who have applied SSTP technologies or management practices**

The data for indicator 1.3 was collected through the project survey, during which respondents were asked which of the promoted technologies they had applied for each of the project promoted value chains.

The project was able to exceed this target by reaching 364,375 farmers applying at least one of the promoted technologies, representing 405% of the target of (90,000) – a significant overachievement, representing a conversion rate (comparing the number *accessing* ICT services with the number of people *practicing* the promoted technologies) of 74%.

Considering both genders, the conversion rate was much higher for radio (80%) than for the 321 platform (36%) - suggesting that the radio programs were a more effective ICT channel for stimulating behavior change. Interestingly, though, the 321-platform conversion rate was higher for women (44% conversion) than for men (31% conversion), while the opposite was observed for the radio programs (with a 73% conversion rate for women compared to an 87% conversion rate for men). This suggests that the 321 platform was more effective at changing women's behavior than the radio programs, and vice versa for men, though it is not clear what the causes of this may be - especially since radio was the more popular ICT channel for female users.

The overachievement of this target results from the fact that the total conversion rate of 74% was far higher than had been expected (30%). While the project's actual conversion of 74% rate may appear very high, it can probably be attributed to the project addressing three key issues in terms of promoting the uptake of new technologies:

- 1) **Farmers were provided with significant in-field support to implement the technologies** – most importantly, extension staff support leveraged extension support from existing extension services by way of other NCBA CLUSA managed project extension officers (though practical demonstrations, field days organized at demonstration plots, technical assistance visits, etc.) which was complemented the ICT enabled services. Thus, many farmers were receiving an integrated set of mutually reinforcing communication channels that firstly disseminated information on GAPs and then supported them to put the learning into practice.
- 2) **The content was relevant, appropriate and genuinely useful and for the target audience** - including a range of different groups of crops (e.g cereal, roots, horticulture, beans etc.), different management practices (e.g. use of improved varieties, land preparation, plating time, weed and pest control, post-harvesting

methods, etc.) and different application periods throughout the year. Some of these, such as horticultural crops, were not anticipated at the project design stage. This gave users a wider choice of appropriate practices to choose from, while also considering their preferences, habits, time and other resources.

- 3) **The services promoted technologies which were available to farmers** - the addition of more dynamic information relating to prices, products and services (not previewed at the project design stage) ensured that not only were farmers received timely information regarding access to and use of GAPs, technologies, products and services.

#### **4.1.4: Indicator 1.4 - Number of hectares under improved technologies or management practices as a result of USG assistance**

482,601 hectares were cultivated under promoted technologies, corresponding to 2,145% of the overall project target (22,500 ha). The overachievement of this target is due in part to the overachievement of the number of farmers applying improved practices (as indicated in indicator 1.3 above). Additionally, the project had assumed an average farm size of 0.25 ha as opposed to the actual average size (according to the project survey) of 1.0 ha. It should be noted, though, that even if the project used the assumption of an average farm size of 0.25 ha it would still have exceeded the target for this indicator 91,094 ha (=364,375 farmers \*0.25).

#### **4.1.5: Indicator 1.5 - Number of farmers who have received donor supported short-term agricultural sector productivity training or food security training (optional).**

This indicator was not reported since the project did not entail any activities related with productivity or food security training.

#### **4.1.6: Indicator 1.6 - Percentage of costs of ICT-enabled services covered by non-donor sources**

Indicator 1.6 is used as a measure for financial sustainability of the ICT services and the potential for scaling up through private sector initiatives. It assumes that the more the costs of ICT services are covered by non-donor sources the more likely the ICT services will be able to continue through self-sustaining local processes based within the local market system.

92% of the costs of ICT-enabled services was covered by non-donor sources - three times more than the overall target (30%). The project overachieved on this target both in terms of the radio and 321 components. Estimated contributions for ICT maintenance costs are described on the table 15.

##### *321 Service*

92% of costs were contributed by non-donor sources, compared with the target of 90%. The cost share obtained was a result of Vodacom contributions through the donation of free SMS, USSD and IVR as well as Vodacom contributions to the launch of the Agriculture-321 service and a promotional “push” SMS sent to the all Vodacom subscribers. Vodacom stands to gain by offering services which increase customer loyalty and enable the company to better stand

out in a crowded marketplace which in principal could make the 321-platform element of the suite of ICT services sustainable. The fact that most of the 321 platform's costs were covered by Vodacom is a promising sign for the future sustainability of the 321 platform. Clearly, full sustainability for the platform has not yet been achieved and it remains to be seen if Vodacom is willing to continue to engage in the 321 agricultural platform, perhaps with different donor support. However, the fact that Vodacom was not willing to make its toll-free webpage available gives rise to some concern as to its future commitment to embedding the platform in its business model. Promisingly, though, there are many options open either to Vodacom or another organization seeking to utilize the cellphone network to sustainably disseminate information to smallholders, the most likely would include the provision of marketing and market data provision services targeted at the private sector and end consumers (Business to Business and Business to Consumer or B2BC) – see *recommendations* for further information.

#### *Radio*

86% of costs were contributed by non-donor funds, compared with a target of 20%. This overachievement was due to the additional contribution from community radio stations who donated space for program advertisement (both for 321-service and radio programs), and the repetition of radio episodes. However, in order to ensure that community radio programs are fully sustainable, community radio stations will need to seek alternative revenue streams such as by offering market data sharing and marketing services to the private sector (see *recommendations* below).

#### *Videos*

Although none of the costs associated with the video production originated from non-donor sources, the project has shown that by experimenting with embedding these within the local market system (e.g. by engaging with inputs companies so that they can produce and disseminate these via their agrodealer networks) it may be possible to make these financially sustainable.

Table 15. Estimated contributions for ICT maintenance cost from non-donor sources

ICT-enabled service channel disaggregated	Non-donor sources of revenue or other income that support the program's ICT Extension effort (numerator)	Contribution from non-donor (\$)	Total cost of delivering ICT-enabled service (denominator)	% of costs of ICT-enabled services covered by non-donor sources
<b>Radio:</b>	Radio advertising (321 platform)	\$2,442	\$3,300	74%
	Radio advertising (Radio programs & Uliza)	-	-	-
	Radio airtime for repetition of episodes	\$2,673	\$2,673	100%
<b>Text (SMS):</b>	Vodacom (SMS)	\$43	\$43	100%
	Vodacom promotion (SMS)	\$185,856	\$185,856	100%
<b>USSD</b>	Text (USSD)	\$19,419	\$19,419	100%
<b>Voice (IVR):</b>	Total costs/Minutes for the 6 free calls	\$159,266	\$159,266	100%
	Vodacom donation for non-free calls	\$76,046	\$104,613	73%
<b>321 service</b>	Other costs & launch of 321 service	\$2,865	\$5,730	50%
	Launch 321 service/Agriculture content	\$0	\$5,000	0%
	321 advertising Material	-	-	-
<b>Video:</b>	Material for dissemination & Training	-	-	-
<i>All ICT-enabled services</i>		\$448,611	\$485,901	92%

## 5. Major challenges and deviations

### Late contracting of Radio Officer

The project experienced challenges in hiring personnel within the first year. Most significant was the Radio Officer, who was not hired until October 2016 and, after onboarding and training, was only able to support radio stations to broadcast programs in March 2017 - when the project had completed one full year of activity implementation. However, the project was able to catch up by increasing the number of stations with whom it worked in Years Two and Three, making a total of five stations by project end (in addition to repeating some materials on a further two stations). Given the overachievement of the radio related targets, we can conclude that this challenge was successfully overcome.

### 321online.org unavailable

The absence of Vodacom's 321online.org toll free webpage meant that it was not possible to disseminate information to extension staff via the internet. To compensate for this, the project prepared a technical manual for extension staff, which covered GAPs for the main crops promoted by the 321 platform, which was condensed and translated into IVR messages and disseminated via the 321 platform. 4,826 people accessed this (36% women). Additionally, the use of video screens mounted in agrodealers' stores helped to compensate for the lack of videos disseminated via the webpage. Although the impact on extension staff was probably lower via the agrodealers' stores than it would have been if they had watched videos via the webpage (since only around 40 NCBA CLUSA staff and 12 government staff participated in the community video screenings), a surprise result of this deviation from the plan was that the project was able to test a potentially most

sustainable method of disseminating audio-visual information to farmers by way of engaging the private sector to produce videos and disseminate these through their agrodealer networks. From a market perspective this potentially a much most sustainable solution for extension than relying on traditional extension systems which rely on face to face contact with extension staff.

### **Limited Vodacom coverage**

Although Vodacom is widely used in urban areas, it has poor network coverage in many rural areas and therefore many farmers use its main competitor, Movitel. Since the 321 platform is currently exclusively accessed through Vodacom, this limited the use of the services in many districts, with little that the project could do to circumvent this problem. In order to scale up the use of this or similar services in the future implementers should consider integrating ICT systems to the all existing local mobile phone operators (e.g Movitel and Mcel) if those operators show willingness to do so - note, however, that Movitel operates a different business model and has not to date shown itself interested in engaging with a 321 type platform.

### **The cost of ULIZA as a platform for engaging with radio stations**

Although ULIZA was clearly a useful feedback mechanism platform that enabled radio stations to engage with their listeners, farmers' lack of familiarity with it meant that less than 1% of listeners used it. Additionally, ULIZA is not currently financially sustainable for most community radios. To resolve this, the project experimented with the use of a freephone number or "linha verde" (green line) which, although it lacked some of the advantages of ULIZA (e.g it required radio staff to be present to take the calls and it did not work for all the phone networks at the same time) resolved both the problems of farmer familiarity and cost. The lesson to take away from this is that unless radio stations can make their programs and related activities (e.g. their feedback systems such as ULIZA) more financially sustainable, they will likely need to opt for feedback mechanisms that are more affordable (see point below).

## **5.1 Major Lessons Learned**

### **Participatory radio programs are a far more effective way of engaging listeners than traditional programs, but they need to be sustainable and embedded in the local market system**

Farm Radio International's model of interactive radio programming is far more effective way of assuring listeners' interest than treating farmers as passive listeners. However, this comes at a cost (ULIZA, formative research, setting up and monitoring CLGs, etc.) which - given that community stations rely heavily on donor and government subsidies and the sale of airtime - most stations in Mozambique are unable to bear. Wherever possible, future interventions should work with local radio stations not just on their production capacity but also on developing a more market orientated business model which will allow them - within the confines of the law in Mozambique - to fund their operations through embedding them in the local market system. This should include training staff in basic business skills and marketing for community radio staff so that they have some notion of costs and revenue streams. Although official commercial advertising is not permitted for community radios (as the majority are government owned and have to follow strict regulations governing their operations), stations find a way around this through "spots" and other informational programs with

a market focus, with platforms such as the Xipalalala platform make it increasingly easy for them to do so by enabling users to more simply access radio services at standardized rates. In addition, today there exists a range of radio, cellphone and online digital feedback tools such as FRI's ULIZA and Green Leaf Digital Information System (in addition to open source technology such as Frontline SMS) which offer add-on offline and online digital services that could potentially generate additional year round revenue streams for radio stations beyond selling "spots" – e.g. through harvesting market data for sale to third parties and conducting listener polls, etc. Community radios should therefore look at tools such a ULIZA as more than mechanisms for quality and monitoring purposes (as Multimedia Extension promoted the use of ULIZA), and instead begin to explore their potential use for generating revenue.

It is noteworthy, however, that the project also learned that the mere existence of and training in these tools is not always enough for community radios to successfully engage with the private sector clients. Equally important is training for private sector staff in how to engage with community radios, work with stations to co-develop spots and programs, and co-create the types of products and services that they want (what marketing terminology calls *co-creating value*). Since at present neither radio stations nor their potential clients know just how much today's digital technology can make possible, donors have a role to play in bringing stakeholders together, demonstrating what is possible and buying down the risk for them to test out models.

**To maximize their impact, ICT and traditional extension models should be used in conjunction to reinforce each other**

The project learned that ICT enabled extension and traditional extension models should not be treated as either/or but, rather, are most effective when they are combined as an integrated set of mutually reinforcing methods. An in-field presence is important both for marketing the ICT extension services (e.g. roadshows, etc.) and for supporting farmers to apply the practices they have learned (e.g. field-based extension staff). Yet traditional extension models are logistic and cost heavy in Mozambique - which is, of course, the *raison d'être* for ICT enabled extension services. Therefore, ICT enabled interventions should leverage existing in-field resources wherever they can - in Multimedia Extension's case this came mostly from other NCBA CLUSA managed projects but equally it would be possible to establish partnerships with other nonprofit or private sector initiatives, as long as there is a clear value proposition. For instance, cotton or sugar companies may be willing to use their own extension staff to market the platform to contract farmers if the platform contained the GAPs and other information which was relevant for their respective value chains.

**5.2 Recommendations for future similar initiatives - with a focus on ensuring sustainability**

Multimedia Extension demonstrated that there is a strong appetite for remote, ICT enabled extension and market information services amongst smallholder farmers. The results also show that farmers not only access these services but also a large part of them - around 74% in the project's case – go on to adopt the practices and techniques promoted. The farmer's appetite for information and uptake was much higher than had been expected, which suggests great unmet potential for further initiatives.

One route to sustainability for ICT enabled extension and market information services lies in finding a private partner who is sufficiently incentivized to provide such services with no donor support. While indicator 1.6 showed that the 321 platform could potentially be sustainable if fully embedded in Vodacom's business model, an alternative company could be one like Lima Links in Zambia - which provides a whole suite of information including GAP related content, market intelligence, marketing services, brokerage and financial services to Zambian smallholders as well as key inputs providers, output buyers and traders (a B2BC business model). For community radios, software - much of its low cost or even open source - now exists that could enable radio stations to run their operations more sustainably if staff are trained in how to use these to generate additional revenue streams, although as a public service it is questionable to what extent community radios themselves will – or should – be expected to become fully sustainable.

In the short term, however, projects such as Multimedia Extension play an important role in preparing the ground, demonstrating the business case for potential service providers to take on the role of ICT service providers and building up demand for such services amongst the private sector who, ultimately, will be the main paying clients. Often this will involve demonstrating to all stakeholders the value proposition of using ICT platforms for extension services and market information systems, in addition to buying down their risk for them in testing scaling up initiatives. In practical terms, this could be done through the following:

- Continued training for community radio staff in production related topics and the provision of grants, where necessary, to ensure that radio stations possess the basic infrastructure with which to disseminate uninterrupted programs.
- Training for community radio staff in business planning, marketing and the use of digital market information tools (e.g. Frontline SMS, FRI's ULIZA and Green Leaf etc.) with a focus on developing more market orientated products/services. Simultaneously, supporting private firms and their staff to collaborate with community radios to design, implement and monitor interactive radio programs that meet their needs and to engage with community radios as a potential source of market data.
- Supporting firms to create audio-visual tools (e.g. instructional videos with a marketing element) and establish/train agrodealer networks (or other channels) for disseminating these.
- Building demand for ICT enabled services at the farmer level, where possible by leveraging support from other private and public initiatives with a strong field presence (e.g. outgrower programs, NGOs).
- In parallel, conducting field-based market research to understand farmers' needs, and feeding this information back to the private sector to present the business case for penetrating this target market.
- Collaborating with and strengthening the capacity of other stakeholders providing existing remote extension and market/pricing information to farmers and supporting them to develop strategic partnerships which can lead to more sustainable channels for ICT service delivery. These could include private partners such as Vodacom and other cellphone



service providers, the Koshiwa pigeon pea price bulletin (produced by the commercial advisory service Nkalo) and the Kugulissa initiative, in addition to NGOs and Government bodies such as SIMA, the Mozambican Grain Institute (responsible for policy issues relating to grains and legumes), the Ministry of Agriculture and Food Security (MASA), the Ministry of Industry and Commerce (MIC) and the Provincial Department of Industry and Commerce (DPIC).

## Annex 1. ICT Performance indicators (explanations)

Indicator	Target	Achieved	% achieved	Observations
# of farmers accessing ICT enabled services	925,000 farmers	1,773,624 farmers	192%	Through the 321 service, radio programs and instructional videos. The overachievement is largely due to the success of the community radio component, which had nearly double the expected potential listenership - around 140,000 potential listeners, compared to an expected 75,000 (based on FRI's experience in other countries with similar conditions)
# of farmers using ICT services	325,000	490,478 farmers	151%	Overachievement was largely due to the success of the radio element. Even more encouragingly, this was not only due to the larger than potential listenership, but also a higher than expected percentage of those listeners went on to listen to the programs: 63% of the potential listeners listened to at least one episode, compared to 50% expected. This indicates that farmers enjoyed the programs and found them relevant to their needs - even more so than had been originally hoped.
# of farmers applying disseminated technologies	90,000	364,375	405%	More farmers than expected tried out at least one of the promoted practices (77% of farmers versus 30% expected). This success is attributed to 1) designing content that genuinely appealed to farmers including several value chains, 2) ensuring that farmers were directed to suppliers of the promoted technologies, and 3) leveraging additional resources to provide complimentary field-based extension.
Area cultivated using the promoted GAPs	22,500ha	482,601 ha	2,145%	Overachievement due to increased # of smallholders applying improved practices. In addition, the project survey found average farm size to be 1ha as opposed to 0.25ha as previously assumed. However, even if an assumption of 0.25 ha had been used, the project would still have exceeded the target for this indicator, with 91,094 ha (=364,375 farmers *0.25).
the costs of the ICT-enabled services were covered by non-donor sources	30%	92%	308%	Contributions came from Vodacom (free SMS, USSD and IVR services; promotional SMS to all subscribers; contribution to the launch of the Agriculture-321 service) and radio stations (donated space for program advertisement and weekly repetition of radio episodes).