INNOVATIVE RADIO BASED EXTENSION FOR AGRICULTURE AND LIVESTOCK PRODUCERS IN KENYA

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ABSTRACT
This is a case study report based on a pilot innovative approach to extension that targeted the dairy farmers in high rainfall areas and subsequently up scaled in a pastoral setting in twelve (12) Arid and Semi-Arid Land (ASAL) counties of Kenya. This innovative radio based training approach was a culmination of a study that showed that 70% of dairy farmers in the high potential areas of Kenya had no access to education or extension messages on dairy production. The objective of the radio programme is to increase extension training and ultimately improve incomes for the dairy farmers as well as the livestock producers in high rainfall and pastoral areas, respectively. The approach involves a collaborative effort between broadcasting radio station that airs interactive discussions by subject matter specialists in the studio and most importantly, field support by government technical officers who create awareness, mobilize and organize farmers and pastoralists into radio listening groups, recap the aired topics with the listeners and carry out practical demonstrations for the farmers. The listeners register by paying KS 100 via Mpesa. Followership is monitored through asking a simple question at the end of each session and listeners answers via the provided cell phone number of registration or through a dedicated number provided by the radio station. The pilot and upscaling have resulted to over 25,000 benefiting while immediate impacts like reduction of milk rejection by a cooperative from 30% down to 8%; stimulating demand for extension (demand for services increased from 59%-68%); pastoralists seeking information about livestock prices increased from 28.1-35.1%, among others. This approach is a useful and penetrative tool of extension, contents, educative, applicable and increase participation of women and youth in agriculture. The county governments and private sector should adopt this innovative approach to reach many agricultural producers.
Key words*: Interactive, Registration, Extension, Dairy, Pastoralists, Upscale*

1. INTRODUCTION

1.1 Background

The livestock sub-sector is one of the several subsectors of the agricultural sector. The latter also comprises of the development of arid and semi-arid lands among others like the crops, land, water and environment. Agriculture is the mainstay of the Kenyan economy directly contributing 26% of the GDP annually, and another 25% indirectly. The sector accounts for 65 per cent of Kenya's total exports and provides more than 70 per cent of informal employment in the rural areas. Therefore, the agricultural sector is not only the driver of Kenya's economy but also the means of livelihood for the majority of Kenyan people (ASDS, 2010-2020). With Funding from the European Union, the Food and Agriculture Organization of the United Nations (FAO) has been implementing a unique radio based extension approach since 2010. The radio based training approach was conceived as a result of a survey results that indicated that over 70% of dairy farmers were not receiving adequate extension. The first pilot dubbed *'Maziwa ni Mali*'

programme that targeted the dairy farmers was quite successful with an enrolment of over 6,000 farmers. It stimulated demand and a scale up to cover areas that had not been covered by the pilot registered further success with over 10,000 registered farmers and over 50,000 more received the messages via radio. A further upscaling of the radio basted training to 12 pastoral counties registered even more success with over 8,000 pastoral livestock producers registering to follow the programme with astonishingly high adoption rates of the training.

1.2 Rationale for use of radio for extension

A study was commissioned by FAO Kenya that aimed at assessing the performance of smallholder dairy assessment within the former Rift Valley and Western regions of Kenya. The target districts included: Rift Valley -Nakuru, Molo, Kipkelion, Uasin Gishu, Trans Nzoia, Koibatek, Kericho, Keiyo, Nandi, Lugari, and Marakwet within Rift Valley and Western Kenya.

The study undertook to assess the current status, constraints, and opportunities within the smallholder dairy sector in key target areas, as a basis for recommending the way forward in regards to enhancing livestock production in support of vulnerable populations in Kenya affected by volatile food prices.

The result on the gaps in extension services indicated that over 70% of the sampled farmers did not have access to adequate extension information and the report recommended use of 'community radio' to reach more farmers. It is on the basis of this finding that FAO Kenya undertook to pilot the use of radio based extension approach with an aim of reaching many farmers within a timely and cost effective way.

1.3 Objectives

To contribute towards improved household incomes and living standards

Specific objectives

i) To increase the number of producers with access to extension information including women with children and the youth.
ii) To provide an alternative mode of extension information delivery through interactive call-in and short messaging (sms) sessions.
iii) To enhance group leadership and dynamics through establishment of farmer cluster study groups.
iv) To enhance synergy between channels of information delivery to dairy and livestock producers
v) To inform the youth about the business opportunities existing in the dairy value chain.

1.4 Extension Methods

Agriculture Extension lacks a single universally agreed upon definition. One of the myriad definitions of extension purport that it is a service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their standard of living and lifting their social standards. This involves the conscious use of communication of information to help people form sound opinions and make good decisions. The radio based training programme has been designed with the objective of increasing the resilience of the target communities to drought.

For the purpose of this publication, extension is defined as "a service of information, knowledge and skills development to enhance adoption of improved agricultural technologies and facilitation on linkages with other institutional support services (input supply, output marketing and credit)". The services are majorly focused on facilitation of linkages of farmers with other institutional support services and aims at "facilitating farmers to improve technologies and adopt them in order to improve their efficiency, income and welfare (Purchell and Anderson, 1997).

In Kenya, agricultural extension was established after the Second World War. The extension services were provided by the government. Over the years, variations in the system have included: a) the integrated approach under the special rural integrated development project, 1970s, b) training and visit system, 1982, c) district focus for rural development, 1984 and d) national agricultural and livestock extension programme, 2000. The government is implementing the National Extension policy which advocates demand-driven extension and participation of other players. Agriculture training is provided in farmer's colleges and tertiary institutions. Shifts in extension policy in Kenya have been due to perceived low impact of agricultural extension. The extension system has been characterized by weak operational framework and poor linkages between research, extension and the farmer.

2. METHODOLOGY/APPROACH

The radio based training approach involves a process of activities with intense involvement of various types of stakeholders. It can also be viewed as a classic case of a synergized public private partnership. The approach was initially conceived by FAO Kenya as a pilot within the dairy sub-sector in the former Rift Valley where the dairy farming is the main source of livelihood for the inhabitants of those areas. The pilot was carried out in 14 districts (currently sub-counties) with astonishing good success and unprecedented positive results that will be enumerated later in this publication. As a result of the good lessons, the radio based training approach was up scaled to extend the same to the Arid and Semi-Arid areas that harbour about 60% of Kenyan livestock. Suffice to say that the livestock in Kenya contribute about 40% of the agricultural GDP (approx. 13%) and it is the main source of livelihood for over 30% of population living in ASALs and the subsector contributes over 50% of the agricultural sector labour force.

2.1 Module/Curriculum development

The initial pilot that targeted purely the dairy sector was premised on an existing curriculum of the Dairy Training Institute (DTI). The adapted module is normally a residential training delivered to farmers for a whole week of 35 hours at a cost of twenty five thousand Kenya shillings (300 US dollar) per participant.

The Dairy Training Institute is a government institution located in Naivasha and was established in 1963. The institute has a wide reach of clientele, being the only dairy training institution within the eastern and central Africa region. The institutional mandate is to impart knowledge and skills in livestock production, hygienic milk handling, processing/value addition, appropriate technologies and entrepreneurship to stakeholders in the dairy sub-sector. It strives to meet this mandate by provision of both theoretical and practical training to dairy farmers and frontline livestock extension staff in the areas of animal breeding, dairy production systems, feeding regimes, quality control/assurance, processing, technology validation and marketing.

The institute offers 4 types of programmes comprised of Certificate and Diploma courses: Certificate in Rural Dairy Management: Certificate in Dairy Science and Technology: Diploma in Dairy Technology which is done in collaboration with Egerton University and a short Tailor-made Course designed to address specific needs of the participants. The short course feature topics like Clean milk production, Quality control/assurance, Value addition, appropriate technologies and Marketing of milk and milk products. For the radio based training approach, the latter module was tailor made and adapted to the needs of the radio extension.

2.2 Module preparation and delivery

It is imperative that preparation determines success and this was very evident in the delivery of the '***maziwa ni mali'*** radio based training programme. The following steps were taken in preparations for the delivery of the radio based training programme targeting the dairy farmers and subsequently upscalling to pastoral areas:

2.2.1 Module for Dairy farmers ('*Maziwa ni mali')*

Several consultative meetings were carried out between FAO and the Ministry of Agriculture, Livestock and Fisheries (Ministry of Livestock at the time) involving the two departments of Livestock Production and the Veterinary Services. Dairy Training Institute also falls under the ministry of Agriculture, Livestock and Fisheries and it was key to the consultations. Figure 1 depicts the conceptual or institutional arrangement in the delivery of the radio programme.

2.2.2. ASAL Radio Based Training module development (*Mifugo ni Mali)*

Upscaling of the radio based training approach to the pastoral areas did not enjoy the privilege of having an existing module. Developing a tailor made module relevant to the pastoral system was the first hurdle to overcome. However, there were a lot of lessons to draw from the module meant for the dairy farmers. The process kicked off with first identifying the relevant middle level college to partner with and this happened to be the Animal Health an Industry Training Institutes (AHITI). There are three such colleges in Kenya (AHITI Kabete, AHITI Ndomba and AHITI Nyahururu). Choice of AHITI, rather than continuing with DTI was as due to consideration of the different mandates. The DTI mainly deals with the dairy technology while the AHITI train Technicians with an emphasis on animal health. However, DTI was quite instrumental in sharing the lessons having participated in both the pilot and the upscaling of the same in wider coverage.

Wide consultations were made between the three AHITI and a small technical group was composed with representation from the three colleges as well as relevant departments in the livestock production and veterinary services with a special emphasis on inclusion of range department. Collaboration with animal welfare organisation

was also sought and this was provided by the World Society for the Protection Animals (WSPA). The technical working group embarked on developing a module relevant to the pastoral system. The results of the technical group were presented to a wider stakeholder meeting with a wide representation from the pastoral areas of North Eastern (Mandera, Wajir, Garissa, Isiolo, Marsabit, and Tana River) among others.

2.2.2.3 Pre-testing of the module

The comments from wider stakeholder presentation were taken on board and a field pretesting of the module was undertaken in three pastoral representative counties namely Marsabit, Isiolo and Samburu. The field pretesting of the draft module involved participation from FAO and the colleges. The involvement of the colleges was to ensure early exposure of the potential subject matter specialists to ASAL environment in preparation for the delivery.

The module was then finalized by taking into account the comments from the field pretesting. The latter mainly involved conducting Focused Group Discussions (FGD) with pastoralists, interviews as well as keen field observations. Field pretesting also helped to assess the likely radio to be used by getting information of the radios that reach in those areas and gauging their signal strength. Having structured the broad topics, the technical group embarked on preparing detailed notes to ensure harmony and consistency in the delivery of the messages.

2.3 Implementation of the Radio Based Training Programme

The implementation of the radio based training programme involves a careful, dedicated and trustworthy execution of the stakeholder mandates. The stakeholders in this case, as depicted in figure 1 include the potential radio listeners, the government field technical officers and their superiors at the HQ, the radio broadcasting station and the technical institution. Each one of them had a specific role, but intertwined and coordinated by FAO. The Monitoring and evaluation team of FAO played a very crucial role in putting in place an MandE system which included a careful Baseline and Endline surveys to monitor the impacts created by the programme.

2.3.1 Government Field Technical Officers

The success of the radio based training programme is hinged on the support provided by the technical field officers. These are based at the field level and are in direct contact with the dairy farmers or livestock producers. Among the activities that were carried out included the following:

- Carrying out mobilization, create awareness, sensitization and registration of radio listening groups be they dairy farmers or pastoralists. They also organize the potential listener groups into radio listening groups.
- In each geographical area of jurisdiction, the field technical teams would organize themselves into Project Implementing Team (PIT) comprising of all the relevant departments from veterinary, livestock production, cooperative to gender
- Maintain active link with the technical institution secretariat and assist in reconciling the registration of the listeners
- Actively participate in the baseline survey and Endline evaluation of the programme
- Monitor listenership and help the listeners to recap/revise the aired topics
- Carry out practical demonsatrions with the listening groups after every one or two of aired topics including organizing field days for target livestock producers
- Reporting progress during mid-review and closure meetings
- Continuously documenting success stories
- Organizing and facilitating farmer/pastoralist exchange visits
- Feedback on challenges encountered (signal strength etc.)

There are innumerable advantages of working with the government technical officers, key among them being sustainability considerations. The extension function is a government responsibility and thus given a tested model, it should be easy for the government to take it up. Another advantage of working with the government is cost implications. As the government personnel are already employed by the government, the project only required to provide funds for logistics (fuel, car maintenance and out of duty station subsistence}.

2.3.2 Identifying the radio station

Organizations have procedures for procurement that must be strictly followed. However, a simple profile of the available radio stations covering the target areas is very crucial to help in the launch of procurement for the radio services. In this particular case, the government technical officers in the target areas wetre quite instrumental in in providing information regarding the available radio stations, their coverage, signal strength and estimated popularity

in listenership. It is debatatble if popularity of a radio is crucial to the choice of the radio. Reports from independent surveys by organizations like Synovate would help in narrowing down to the radio stations to be invited for bidding.

The timing of the day and best hour for broadcsting is a very crucial element in the success of the radio based training programme. During the pilot phase, broadcasting was done every Thursday from 9.30-10.30 PM. The evaluation found that this was a bit too late for for the dairy farmers and there was challenge of other competing programmes from the local fm stations. The upscale in dairy areas adjusted time to 8.00 – 9.00 PM and this was received very well. The broadcasting of the radio based training targeting the pastoral areas was done bettween 8.00-9.00 PM every Friday. Issues about clashing with Muslim prayer time featured in the evaluation. Understanding the daily calendar of the target community greatly helps to negotitae the hour with the radio station. It is one of the critical factors in choosing the radio to award the contract besides coverage of the radio frequency.

The broadcasting station provides the air waves and a lead presenter. The role of the lead presenter is very important and the popular the presenter is the better for the programme. It is imperative that listeners follow presenters and some can easily migrate with entire audience from station to station. In the radio based training approach, the role of the presenter is to lead the subject matter specialists to deliver to the listeners the topic of the day. The presenter also moderates the timings and presents the questions from the listeners to the subject matter specialists in the studio. In case the interactive sessions involve call-ins, it is the work of the presenter to regulate and moderate all these. The radio station provides a dedicated number through which listeners interact with the subject matter specialists during the interactive session and even after. It is normally very important to let the listeners know if the number is toll free or if there is a cost when they send a message through it. The radio station must provide recordings after interactive sessions as these are useful during the recap sessions in the field between the technical officers and the listeners.

2.3.3 Technical Institution or middle level training college

The middle level training institutes involved in these programmes include the DTI and the AHITI, so far. The institutes provide the subject matter specialists for the various topics in the module. The latter deliver the topics within their area of expertise in an interactive session with the guidance of the radio presenter. In this particular approach, two lectures (subject matter specialists) were involved in each one hour interactive topics. The subject matter specialists attend studio sessions where they are led in the discussions by the presenter in a very systematic way. Besides discussions, they answer questions posed by the presenter on the behalf of listeners. The listeners pose questions through short message mobile system (sms).

At the end of the topic of the day, a question is posed to listeners which they are supposed to answer through the same sms system. The question plays two crucial roles of monitoring the listenership and motivating the listeners to stay tuned. The answers are analysed at the end of the programme and the top performers rewarded in a pompous ceremony (if funds allow). The closure ceremony should happen in the location or county that produced the best performers. This closure can also serve as a final monitoring and evaluation where the donor can also be involved as well as the top government decision makers. Such a meeting can serve as a handover to government and crucial decisions regarding future support by the government can be made.

Rewarding immediately at the end of the topic where the winner was announced in the following interactive programme ensured that the listeners paid keen interest to get the answer right. The technical institution takes lead in developing the curriculum jointly with the FAO technical personnel, pre-tests the curriculum, where feasible and provides the subject matter specialists. Further to the provision of subject matter specialists, the technical institution sets up a secretariat with dedicated customer lines to register the potential listener farmers or pastoralists, receive farmers calls and SMS's, offer timely responses to farmer questions and monitor the followership by the farmers through sms feedback and calls. The secretariat also analysis the answers to the question posed to the listeners at the end of every topic. In the programme targeting the pastoralists, a motivation concept was hatched whereby, the first correct answer was announced during the following programme and awarded Kenya shilling 1000/= via M-Pesa to his or her phone. This greatly enhanced listenership and keenness to get the message.

The secretariat was mandated to maintain linkage between the institute and the field (officers and producers) during the project period. Dairy Training Institute provided the needed technical services to the radio based extension for the dairy farmers while the Animal Health Training Institute provide the service for the radio based extension targeting the pastoral areas. The European Union has been funding right from the pilot that was funded through the EU Food Facility programme up to the upscaling that has been funded through the 'Improved CommunityDrought Response

and Resilience' project component of the Kenya Rural Development Programme. Overall coordination was carried out by FAO personnel in charge of the programme. FAO also provided technical backstopping to field technical officers and technical institutions.

2.3.4 Certification and Awarding good performers

Ensure certification and recognition of farmers who showed exemplary performance in answering questions during the interactive sessions. Registered farmers and livestock producers that followed the radio based training programme were awarded DTI and AHITI certificates, respectively. The awarding is normally done in a closing ceremony that involves participation of donors, local government and FAO and most importantly by the listeners who have been following the programme. The participants use the occasion to show case what they learnt over the radio programme period. The closing ceremony also serves as an evaluation as well as a handing over ceremony.

Successful radio listeners receiving their awards for good performance during the radio based training programme (*photo courtesy of Kamande Njuguna*)

3.0 Upscale to dairy areas

After the successful pilot of the radio based training programme in 14 districts of the former Rift Valley, the news about a new way of reaching farmers spread and the demand to extend the programme to the neighbouring districts grew. In essence, with more funding from the EU, an upscaling of the radio programme was carried out in ten (10) more districts both in former Rift Valley province and Central Kenya. This first upscaling of the radio based training programme registered 10,164 dairy farmers and 3000 from the East African Dairy (EAAP).

3.1 Synergy with other programmes

The collaboration with EAAP with a resultant registration of 3000 listeners was a very good example of synergy building between programmes where the EU programme provided the air waves while the EAAP supported the dairy farmers in five districts (Emuhaya, Murang'a South, Rongo, Taita Taveta and Imenti South). The dairy module was reviewed based on the lessons of the pilot programme and the recommendations made by the participating farmers during evaluation, ensuring that the gaps identified during the pilot were addressed.

The module was then presented at a workshop where the field officers from target districts were in attendance. These districts included Bomet, Bureti, Nandi North, Eldoret East, Subukia and Nyahururu in the Rift Valley province and Nyandarua North, Milangine, Nyeri South and Tetu districts in Central province. Inputs from the Provincial Directors of Livestock Production from the former Rift Valley and Central Provinces were also included.

The following topics were identified by farmers as key and needed to be addressed in the future programmes.

- Feeding and Nutrition including on farm feed formulation
- Diseases (Diagnosis, prevention and control)
- Dairy breeding including use of A.I services
- Pastures and Fodder (Establishment and management)
- Milk Marketing and group dynamics
- Dairy Hygiene including prevention of mastitis
- Value addition and related statutory requirements

Based on the analysis of the above challenges raised by the farmers and also based on the number and frequency of questions asked the following topics were added to the revised module: Biogas production, requirement for cottage

milk processing, milk testi ng and Stocking rate, leguminous plant establishn

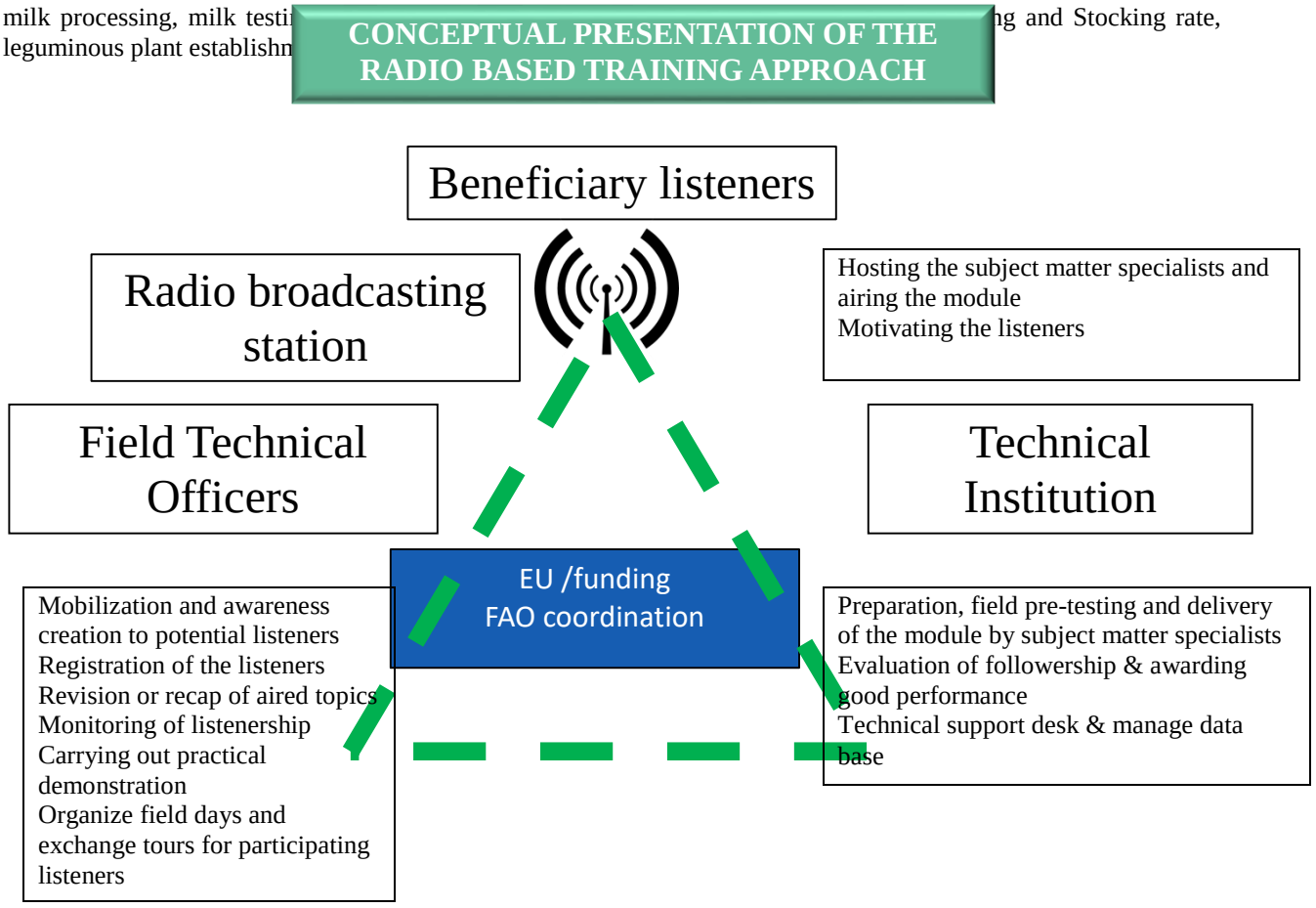


Figure 1: Institutional arrangement of the radio based training programme

4.0 Monitoring and Evaluation

4.1 Baseline Survey

During the pilot programme and subsequent upscaling within the dairy sector, the baseline survey was carried out by the DTI to determine the status of the participating farmers at the beginning of the radio training. However, during the upscaling to the ASAL or pastoral areas, FAO carried out the baseline survey in the target 12 counties. This was meant to ensure a comprehensive baseline study as well as build the capacity of the government technical officers to carry out baselines. By FAO being in-charge of the baseline directly, it meant that the integrity of the data was impeccable. The overall objective of the baseline survey was expected to contribute to the improvement of the planning, monitoring and evaluation of the radio based training programme for the ASAL based training on the analysis of knowledge, attitude and practices of pastoralists in the target 12 ASAL Counties.

The government technical officers were quite instrumental in arranging ground field logistics including mobilizing the potential respondents who were actually registered pastoralists for the radio programme. The survey instrument had been developed in a participatory manner between the FAO Monitoring and Evaluation office, FAO livestock technical experts and the government technical officers including the AHITI personnel. The baseline parameters included the personal and demographic characteristics, data on livestock production, economic characteristics as well as access to markets, livestock diseases and access to extension information, training needs as well as social information issues among others.

1.1.1 Challenges during baseline

The ASAL counties are normally very vast and the programme had targeted these counties for the radio based training programme. Illiteracy rates in most of these counties average over 80% and thus during interviews and FGD,

translation is normally required. This does not only consume time but one may not be sure about the accuracy of the translation.

1.1.2. Broadcasting language

The language of broadcasting language was Kiswahili which is supposed to be the national language in Kenya. However, despite it being the national language, it is still difficult for the ASAL pastoralists to communicate in Kiswahili. This was one of the challenges to the radio programme in ASAL. One of the recommendations picked by the endline evaluation and the official radio programme closure was to have the messages translated to the local dialect for effective impacts.

4.1.2 Air waves

The signal strength was weak in some areas and thus quite frustrating to the listeners. Measures to rectify this involved constant discussion with the radio station to boost their transmission in the respective areas.

4.2 Endline evaluation Results (sample)

A total of 12 counties were covered at baseline. This was to ensure county specific information on animal health and production was collected for use by the counties. End line however was done in a sample of 6 counties (Samburu, Wajir, Makueni, Kajiado, west Pokot and Tana river) representing the livelihood zones of the 12 counties. A total of 1204 livestock producers were interviewed at baseline and a total of 333 at end line. In addition, at the end line, focus group discussions were held with at least 5 producer groups in each of the 6 counties. The sample size for both assessments was calculated using 95% confidence level, a confidence interval of 10 and a maximum of 3,000 registered livestock producers per county. Sampling was done to cover at least 80% of the groups formed and from each sampled group, producers were randomly selected from the register and questionnaire administered.

4.2.1 Endline evaluation sample Results

The following are a few examples of immediate impacts as a result of the radio based extension that was carried out for only six months in pastoral and dairy areas respectively. The pilot programme ran for one interactive hour per week for twenty three weeks, the upscale to dairy areas ran for thirty weeks while the ASAL radio based programme ran for 23 weeks.

Pasture and Grazing Management System

On pasture management system, there was notable increase in the % of producers who adopted reseeding from 7.3% at baseline to 26% following the training.

Grazing Management System

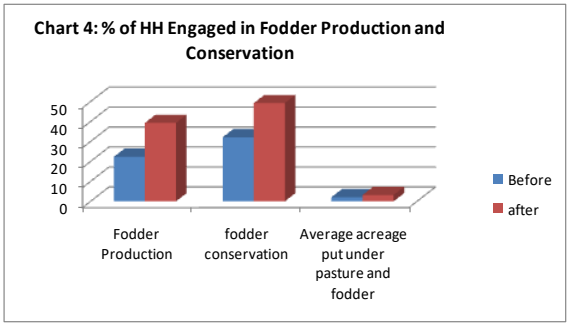
On grazing management system, there was increase in the % of producers practicing dry/wet season grazing areas (From 51.5-56.2%) and deferred grazing system (20.6-36.3%)

Animal Identification

There was increase in the % of producers who are practicing branding, ear notching and decrease in the % practicing traditional brands.

Increase in pasture production and conservation

Majority of producers are now establishing and conserving pasture. There was increase in the % of producers engaged in fodder production (22.3%-39.3%) and fodder conservation (32.1-49.2%). There was also increase in the acreage put under fodder from an average of 2.1 to 3.2 acres per household.



Improved extension service with increased demand for services by the producers

Livestock production and health messages were provided through Chief's Barazas before the radio programmes. There were limited extension services for the farmers, most of who did not even know the qualified service providers to consult when in need for service. This has changed. Focus group findings from 6 counties showed that producers now know where to go or who to call for animal health services. They now know the government extension officers and have their cell phone contacts. *'We are not strangers with the government extension officers anymore, we can call them because we know them'', said assistant chief of kongelai division who is a member of pokea mali listening group West Pokot.*

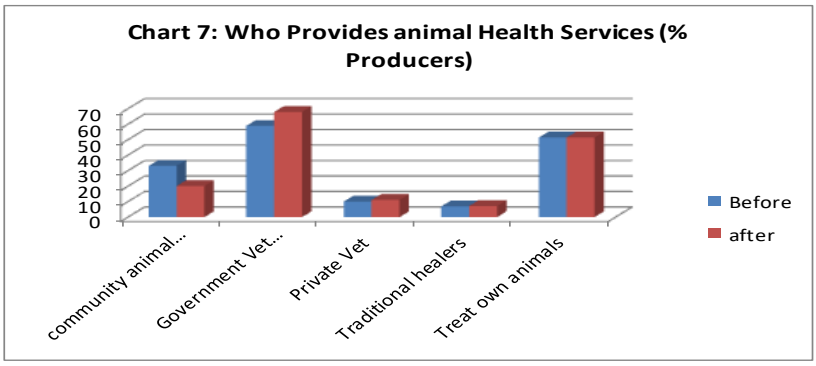


Table 1 shows a sample of immediate impacts due to the radio based training programme in Dairy areas.

Table 1: Changes as a result of the radio programme

Application of ideas gained	Less	98% of the participating farmers applying the training.
Clean Milk production	30% of the milk rejected at the reception platforms	Post-harvest losses decreased from 30% to a low of 8%. Saving an average of 900 lts per day which translates to at least Kshs. 11 million in the 14 districts per month.
Milk production	66% of the Farmers producing < 10 litres per day	On average milk production increased by 25% after adoption.
Milk marketing	15% in marketing groups	45% of the field school clusters converted to milk marketing groups.

4.2.2 Beneficiary testimonies/success stories

- **Improved production and income:** Kanaani group in Makueni has a total of 22 farmers. Members have an average of 2 dairy cows. Following the training, and adoption of practices taught, they have been able to increase the amount of milk they sell from 25 to 200 liters a day. Initially, only 4 of the farmers were taking milk to the dairy, now 15 out of the 22 take milk to the dairy. Due to increased milk production and need to deliver the milk daily, the farmers have employed someone to deliver their milk for a total of Kshs 15,000 per month. The group

has ventured into poultry production too. As at the end of the training, a total of 14 of them had / or were in the process of constructing a conventional poultry house and the goal was to have all 22 with poultry houses, and in poultry production by the end of the year.

- **The training was a refresher course for extension government workers.** *'This is refresher training. I last saw some of the animal husbandry equipment provided by the project in college" Said a Government extension worker in West Pokot district*
- **Collective Marketing** by Ona Mbee group in Makueni*: ''This training got us from somewhere and has taken us elsewhere" said Grace Mongoyo, chairperson of the group.* The group of 64 members composed of over 96% women, now does collective marketing of their chicken and eggs. They used to sell one chicken (Despite the weight) at Kshs 150 but now sell at 500kshs per kg.
- **Boiling milk:** A whole village, Karapker in Sigor west Pokot, now is boiling milk to avoid getting milk borne diseases as reported by chairman of Kiprui listening group in west Pokot.
- **Informed participation in county budgeting process:** the group are now empowered to question the rationale behind the county budget
- **Uptake of the innovation by Counties:** Makueni and West Pokot counties have planned to replicate this extension model using the local language. Use of local radio stations was one of the key recommendations across the counties.

CONCLUSIONS

Radio based extension is feasible and a viable venture that can be used to reach many farmers and producers in a cost effective way. It is an extension method that has the potential to spur the economy and contribute to the alleviation of poverty. Majority of the farmers are interested with information which translates to increased and sustained productivity throughout the year. Market access for small holder producers remain a major challenge. Radio based training plays an integral role in delivery of extension messages. Farmers demand for extension service is stimulated through radio training. Radio messages have been found to carry more weight. Radio also reaches a wide range of clientele within a short time

RECOMMENDATIONS

With the advent of devolution, Collaboration between Development Partners and County governments to upscale the radio based training approach using local dialects will give extension the required impetus for development. Radio gives youth an opportunity to get extension messages and they can be easily targeted using the radio. In the design of the radio based extension, the involvement of field based technical officers is a great contributor to the success and effectiveness of the programme and greatly enhances adoption by the livestock producers and dairy farmers. Next steps should involve carrying out the radio based training through the local dialects. This should be feasible as there is virtually an fm station broadcasting in a local language. To be cost effective, the cluster approach should be adopted where counties with people speaking in the same language are aggregated and targeted. An elaborate study to determine the true impacts and the success factors contributing to the success of the radio based training approach is imperative.

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