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Effectiveness of Community Radio in Disseminating Market Information among Smallholder Maize Farmers: Experience from Suba Sub-county- Kenya

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Abstract:

Community radio is a powerful tool in imparting agricultural knowledge and creating awareness among farmers. However, no evidence shows that community radio could address the dilemma of poor access to market information among maize farmers. This study sought to assess the effectiveness of community radio in accessing market information in this area. A multi-stage sampling technique was used to collect cross-sectional data from a sample of 97 maize farmers using pre-tested and semi-structured questionnaires through face to face interviews. The analytical tools were descriptive statistics, rating of effectiveness and Chi-Square. The findings revealed that majority (82.5%) owned and operate radio sets; (55.7%) obtain information from community radio while (44.4%) obtained information from traditional sources. Large proportion (83.6%) affirmed that community radio was an effective platform for disseminating market information. The Chi-square test for effectiveness of community radio in disseminating market information at 0.01% level of probability showed the calculated Chi-square to be $X^2=50$ which is much higher than the Chi-square table value of 11.34 hence community radio was found to be effective tool for communicating agricultural innovations to smallholder farmers. The study recommends use of appropriate language and close interaction between agricultural stakeholders for effective delivery of agricultural information.

Keywords: Effectiveness, dissemination, market information, community radio, Suba

1. Introduction

Majority of the Kenyan population live in rural areas and largely depend on agriculture for their livelihoods. These rural people have long time experienced reduced net revenue from their farm produce due to inability to access marketing knowledge which consequently lower their capacity to expand their production and investment (Dey et al., 2008; Shiferaw et al., 2009). Lack of adequate information on market price, weather, inputs and farm management expose smallholder families to market risks and uncertainties (Okello et al., 2011). As a result, their farm incomes are negatively affected due to increase in transaction costs and reduced market efficiency (Ferris, 2005; Obidike, 2011).

One of the threat facing small scale farmers in marketing is post-harvest losses. In Kenya, cereal crop farmers alone incur losses ranging from 10 percent to 14 percent of the total production cost. This includes losses in quantity and quality which adversely affect prices of the produce in the rural markets (Oendo et al., 2003; FAO, 2009). However, farmers who receive relevant, accurate and up to date information do not incur market risks (Mittal and Tripathi, 2009). This is because they are able to make sound decisions on their market participation.

The dynamics existing among rural farmers in Kenya is high illiteracy level and low connections to electricity. In addition, the past traditional extension methods have not been efficient in delivering agricultural information (Albert et al 2014). These conditions compel rural people towards searching for alternative source of information which addresses their information needs and demands. ICT tools being employed in developing countries to access agricultural information include mobile phone, TV, Videos, internet, Newspapers and Radio (Asenso-okyere and Mekonnen et al., 2012). Radio is considered to be the cheapest gadget to acquire and

maintain (KNBS, 2010; TOF, 2012). Platforms available for application of radio include cell phones, internet and their cars to listen to radio programs (royal media service annual report, 2012) attributing that the fastest media channel that can disseminate accurate and relevant agricultural market information to mass of smallholder farmers is community radio. Seemingly, these resource poor rural dwellers need a medium of communication that is cheap and consume less power for even agricultural development. Farmers' linkage to up to-date and timely market information would therefore reduce the post harvest losses and enable better prices in the markets. Despite the fact that several past studies recommended the use of ICT tools to access agricultural information, the question is; does that information reach the target audience at the right time in the right form? Timely market information is aimed at connecting smallholder farmers to competitive and better markets for their produce. However; rural farmers in the developing world and particularly Kenya are still constrained by poor access to agricultural market information across agricultural supply chain (Obidike 2011; Spurk et al., 2013). In sub-Saharan Africa radio is important in creating awareness, attitude change and imparting knowledge among rural farmers and it is perceived to be the most popular medium for communicating agricultural information among its users (Nwachukwu, 2010; Sanga et al., 2013).

With regard to community radio (Vernacular radio), several studies show that it is the most reliable, accessible and an effective source of agricultural information among small scale farmers. A radio medium that broadcasts information in native language enables information flow and puts the audiences at par with rest of the world. Large proportions of rural communities in Kenya use indigenous languages more frequently than the two official languages (English and Kiswahili). These two languages do not address their immediate needs because they possess low levels of education thus make it impossible to participate in public discourse and affairs conducted in official languages (Orao, 2009).

Furthermore, Community radio can play a critical role in rural development and poverty reduction as it improves the ability of rural farmers to obtain information for sound decision-making, enables farmers in identifying potential buyers and purchase of inputs in rural markets (Joseph et al., 2015; Odira, 2014; Aker, 2011; Orao, 2009). However, no documented evidence has established the effectiveness of community Radio in disseminating agricultural market information. The current study therefore sought to evaluate the effectiveness of community radio in terms of percentages of ownership, information sources, listenership trust and utilization.

2. Methodology

2.1. Study Area

The study focuses on Suba sub- County, located in south-west Kenya bordering Lake Victoria. The study area was purposively selected as it is the granary of Suba sub- County; the population is homogeneous and hosts majority of the farmers who are constrained by poverty due to low incomes from their farm produce. The area is located on the South-Western coast of Lake Victoria between longitudes 34° E and 34° 20''E and latitudes 0° 20''S'' and 0 and 0° 52''S. The District has an area of 1,055 km², the population consists of district is 170,000 mainly Luo Suba people (KNBS, 2010).

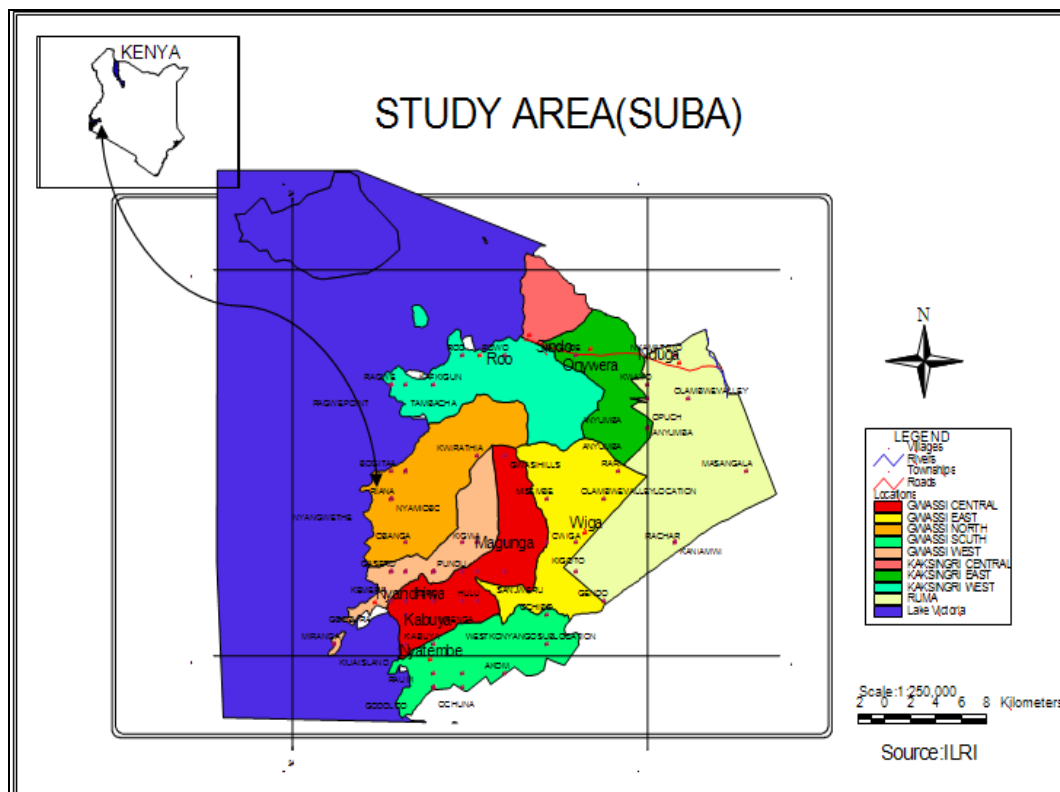


Figure 1: Map of Suba District

The region receives short and long rains a year and the rainfall distribution is influenced by the geography of the land. It ranges between 800- 1900mm per year. The main markets are Sindo, Magunga and Mbita. Suba district is one of the districts in Homa Bay County whose population are mainly farmers and fishermen and the poverty rates is about 50% in the region although has very high agricultural potential, the major food crops grown include maize, millet, cassava and sorghum (Suba strategic plan, 2010).

2.2. Sampling Frame and Sample Size

The sample frame for this study comprises of 250 smallholder maize farmers from Seka and Rang'wa east sub-locations in Suba sub-county perceived to have better farming and good radio listenership habits. The sample size was determined using the formula adopted from Mugenda and Mugenda (2003) Fisher's formula Where $n = z^2 pq/d$ giving a final sample size of 97 farmers.

2.3. Data Collection

The survey was carried out between August and September 2015 during harvesting period to assess the effectiveness of community radio in disseminating market information in Suba sub-county. The survey area consisted of two administrative locations that are Gwasii east and Kaksingri west; from the locations, two sub-locations were purposively selected based on better farming and good listenership habits. The permission to carry out research was obtained in advance from the area chiefs from two locations and the validity of the instrument were ascertained by pretesting the questionnaires on 10 (ten) smallholder maize farmers from both sub-locations. Identification of active farmers was done with the help of frontline farmers and clan elders to obtain the required information aimed at achieving the objectives, the semi-structured questionnaires were administered systematically to every third household heads through face to face interviews.

2.4. Analytical Tools

Descriptive statistics such as frequency, tables, percentage, and rating of effectiveness (effectiveness index) were used for quantitative analysis; Chi-square test of significance was employed for testing the research hypothesis. The Rating of effectiveness was employed to analyze the effectiveness of community radio in disseminating agricultural market information among the respondents. Rating was done by means of ranking the effectiveness of community radio by the respondents on a scale of 1-4 with 1=most effective 2= effective 3= less effective and 4= not effective. Effectiveness in this context of the study refers to the ability of community radio in relating agricultural market innovations to farmers (Ariyo et al., 2013). Chi-square analysis was then used to test the hypothesis that community radio is not effective in disseminating market information among smallholder maize farmers in Suba Sub-county.

2.4.1. Chi-Square Mathematical model:

$$X^2 = \sum \frac{(F_O - F_E)^2}{F_E}$$

Where X^2 = Chi-square calculated

F_E = Expected frequencies

F_O = Observed frequencies

\sum = Summation sign

3. Results and Discussions

3.1. Socio- Economic Characteristics of the Respondents

Table 1 presents the summary statistics of the key variables representing farm and farmer characteristics of the sampled population. From the table, over 80 percent households in suba Sub County were male dominated. Those headed by females were (17.5%; 17) and only (2.1 %; 2) of the households were headed by sons. This implies that men are still regarded as the senior most and are responsible for final decision making. In terms of gender, the study revealed that farming in suba Sub County is dominated by female (52.6%; 51) with male farmers representing (47.4%; 46). The findings affirm that men are mobile and they form the majority of urban dwellers, they look for jobs and better livelihoods for their family unlike women who remain in their homesteads carrying out domestic duties like child care, farm duties and cultural limitations. These percentages tally with what (Okello et al., 2012) noted in western Kenya that at least 30% of agro-dealers are women. Another interpretation of finding is that women are more into farming than male counterparts in the study area. Age is determinant factor in identifying farmers who are experienced, risk takers and fast adopters of new technologies. The finding shows that over 80 percent of the respondent in the study area fall within the economically active age group of between 18-55 years and only (18.8 %) are above 55 years. This depicts that the age of the respondents could facilitate the willingness to explore and implement new ideas for profitable practices than older farmers who are regarded as experienced and conservative to their old methods of farming (Ango et al., 2013).

The findings further revealed that (78.4%) were married; 19.6% were widowed and only 2.1% were single at the time of the study. These may be attributed to strong socio-cultural and religious beliefs in the study area where marriage is regarded as an important institution for continuity. The occupation of an individual is an important factor that denotes a person's source of livelihoods, lifestyle and economic status. The study findings revealed large proportions (80.4%) of the respondents were farmers, 10.3% were self-employed and 9.3% were salaried employees at the time study was conducted thus farming dominated as the main economic activity in the study area.

The study indicated that the majority of farmers (60.8%) in the study area possess primary education, (19.6%) had secondary education and (10.3%) attained tertiary. The low- levels of education are attributed to low reception power of national languages (English). According to Republic of Kenya (2007) low education hinder farmers from engaging in commercialized and sustainable farming hence low productivity. it therefore implies that adoption and understanding of agricultural programs on radio should be aired in a language understood best by the audience. The result is in accordance with (Okwu et al., 2007) that an individual level of education can affect his/ her information access, comprehension and adoption of modern agricultural practices. On the farm income, the study found that (77.4%) of respondents earned between Ksh. 0-40000, 16.4% earned between Ksh. 40000 to 80000 while 6.2% of the respondents earned above Ksh. 80,000 respectively per growing season. The results suggest that majority of farmers in the study area are generally poor and experiences low income from their produce which ultimately affect their ability to expand production and adoption of capital intensive technologies. This finding is in line with what was reported by the Republic of Kenya (2007) that 63% of the population in Nyanza province earn less than 1 dollar per day hence live below poverty line.

Household head	Frequency	Percentages
Husband	78	80.4
Wife	17	17.5
Son	2	2.1
Gender	Frequency	Percentages
Male	46	47.4
Female	51	52.6
Age	Frequency	Percentages
18 -35 years	39	40.2
36-55 years	40	41
Above 55 years	18	18.8
Marital status	Frequency	Percentages
Married	76	78
Widowed	19	20
Single	2	2
Education	Frequency	Percentages
Primary level	59	60.8
Secondary level	19	19.5
Tertiary level	10	10.3
No formal education	9	9.3
Farm Income	Frequency	Percentages
0-40000	75	77.3
40000-80000	16	16.5
Above 80000	6	6.2
Occupation	Frequency	Percentages
Farmer	78	80.4
Salaried- employee	10	10.3
Self-Employed	9	9.3

Table 1: Distribution of respondents based on socio-economic characteristics (n=97)

Source: Field data, 2015

3.2. Extent to Which Community Radio Is Used to Access Market Information

The Ownership of radio sets is an important indicator of availability, accessibility and affordability of the radio among populations. The results revealed that more than three quarters of the respondents (82.5%) owned radio and 17.5% do not own radio sets in the study area (figure2). This finding imply that physical availability of the medium is an important exposure of agricultural programs to farmers hence majority of the farmers in the study area had access to radio market information (Wawire, 2013; Okwu et al.,2007). The proportion who did not own the radio sets may be due to lack of finance to purchase the handset or they did not have interest in radio programs and thus was not their preferred source of information, this reaffirms the report by KNBS of (2009) which indicated that radio ownership in Nyanza region was at (75%).

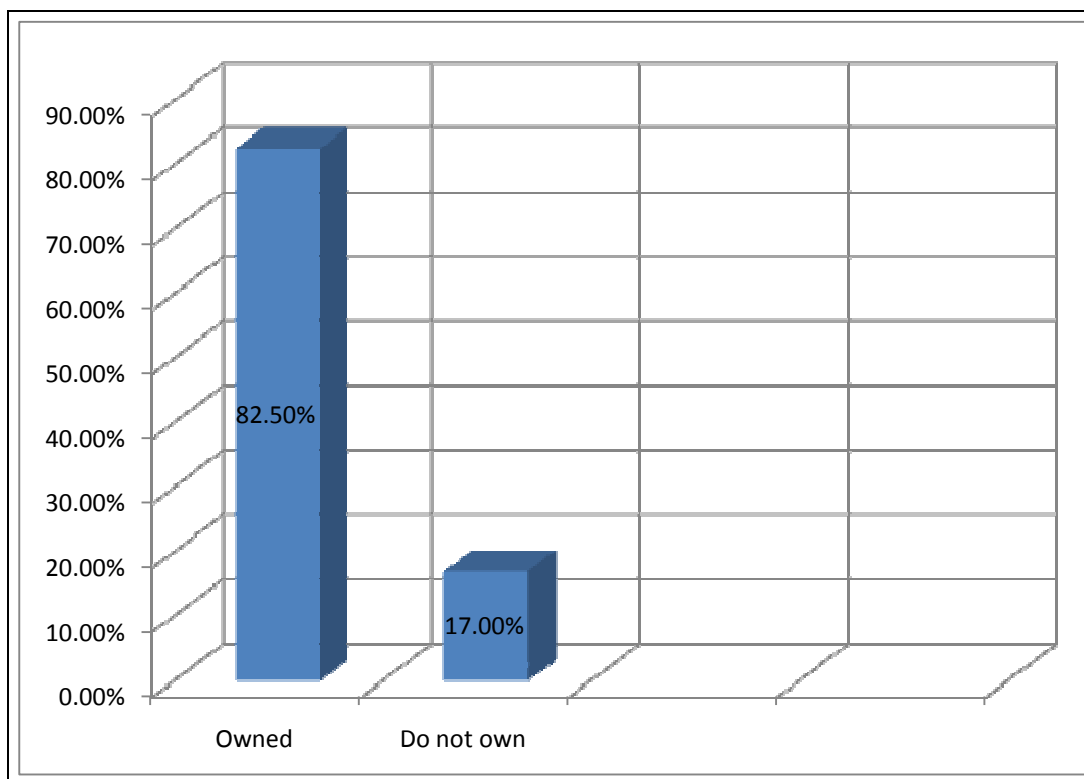


Figure 2: Radio ownership by respondents
Source: Field data, 2015

3.2.1. Source of Agricultural Market Information

The summary of respondents' sources of market information and listenership are presented on table 2. The study findings indicated that more than a half of the respondents (55.7%) access market information through radio, 26.8% obtain information from neighbours, 7.2% access market information through traders and 5.2% obtain the information from farmers' groups and extension agents respectively. The information sources for smallholder maize farmers in the area of study were found to be varied as traditional sources were also preferred by some farmers (Spurk et al., 2013). The percentages can be attributed to the fact that majority of the respondents owned radio sets hence rely on radio as the main source of market information compared to farmer to farmer and extension. The findings also imply that as far as extension work is concerned, farmers still rely on traditional sources to get information and extension agents are no longer important sources of market information among smallholder farmers in accordance with findings in western Kenya that radio is most preferred and is effective tool in disseminating agricultural market information among smallholder farmers. These tally with what (Nyareza & Dick, 2012; Wawire (2013) asserted that extension agents are not reliable in time of need, show discrimination and favouritism in the delivery of extension services.

3.2.2. Favourite Radio Stations for Agricultural Market Information

Favourite radio station of the respondents is dependent on the presenters, the type and quality of information being aired. The results of the study (table 2 below) indicate that almost all the respondents like listening to community radio but the choice and preference towards a given radio stations differs. Radio Ramogi FM was found to be the most favourite radio station in delivering agricultural information with 61.9%. Only 19.6% of the respondents liked Lake Victoria and 2.1% preferred Radio Nam Lolwe for agricultural information. The other 16.5% did not listen to any of the stations implying that they did not access the radio sets because it's expensive to purchase, secondly, they used other sources of information. From the findings, it can be said that Radio Ramogi is indeed leading in the number of audiences and listenership in Suba sub-county thus support the report given by (Okoth, 2015; RMS, 2012); again, preference may be attributed to the clarity of messages and quality of information aired through radio Ramogi fm compared to other stations. However, this is contrary to what (Odira, 2014) reported that radio Nam Lolwe was the favourite radio station with (68.3%) in Kakelo location Rachuonyo district in accessing agricultural information and that Radio Ramogi accounted for only 20% listenership. Therefore, choice and preference towards a given radio station differ with regions and attitude of the audience. The proportion of the respondents who listened to any of the radio stations was found to be (83.6%) implying that the respondents preferred community radio as their main source of agricultural information and the following were highlighted to support their opinion.

- Timely dissemination of information
- Use of appropriate native language
- Show no discrimination in the programs

- Give elaborate information affecting peasant farmers

3.2.3. The Respondents Listening Time and Frequency

The study showed that 40.2% of the farmers listened to agricultural programs during evening hours, 37.1% of the farmers listened during every news time, 4.1% listened during morning hours, 2.1% listened during lunch hours and 16.5 % of the farmers did not listen to radio completely. The percentages of the respondents who listened to agricultural programs in the evening and every news time were the majority and hence it implies that farmers in the study area engage in either domestic or farm duties throughout the day and that majority of farmers find leisure time in the evening hours when they are off farm duties therefore any intended agricultural programs that needs the attention of farmers has to be aired at the convenient time of farmers (Ango et al., 2013), this is because the time at which the radio programs are presented is a determinant factor in technology adoption for agricultural development. The findings can also be attributed to the portability of radio sets which farmers can carry a long when going to their farms and get news accordingly which is in agreement with what (Karembu & Nguthi 2011; Odira,2014) found in Kenya and Burkina Faso.

Further in terms of listenership, the study found that a good number of the respondents (74.2%) were daily listeners; 7.2% were weekly listeners; 6.2% were monthly listeners and 12.4% were not radio listeners. Implication of the findings is that majority of the respondents in the study area spend a lot of time listening to radio programs on a daily basis. This may be due to high accessibility, affordability and portability of radio sets meaning they can be carried to the farms which guarantee listening anywhere at any time of the day (RMS, 2012; Odira, 2014). The proportion of the respondents who listened on a weekly and on a monthly basis could be due to limited access of the handsets. On the other hand, none listeners (12.4%) accounted for those who lacked radio handsets in their households and interest in the rural radio programs.

Source of Agricultural market information	Frequency	Percentage
Radio	54	55.7
Neighbours	26	26.8
Traders	7	7.2
Farmers groups	5	5.2
Extension Agents	5	5.2
Favourite radio station	Frequency	Percentages
Radio Ramogi	60	61.9
Radio Lake Victoria	19	19.6
Radio Nam Lolwe	2	2.1
None	16	16.5
Time of listening	Frequency	Percentages
Morning	4	4.1
Lunch	2	2.1
Evening	39	40.2
Every news time	36	37.1
None	16	16.5
Listener-ship frequency	Frequency	Percentages
Daily	72	74.2
Weekly	7	7.2
Monthly	6	6.2
None	12	12.4

Table 2: The distribution of respondent based on market information sources and listenership (n=97)

Source: Field data (2015)

3.3.1. Trust of Community Radio Market Information

An adoption of any new agricultural technologies can be accelerated among rural farming families when the information is trusted (Odira, 2014). In the table 4 below, the findings show that majority (90.7%) of the respondents had trust in community radio market information listened to, (7.2%) had no trust while (2.1%) had no opinion about the quality of community radio information. The study further indicated that the vice versa is true when it comes to provision of feedback to the radio stations via voice calls as almost all the respondents (96.9%) did not provide feedback to any of the radio stations on the delivery of services, only (2.1%) of the respondents provided feedback through voice calls and (1.0%) were not concerned about feedback provision to the radio stations. Since the degree of trust is high in the study area, it implies that any new technology disseminated using community radio station can be highly synthesized and adopted however non-provision of feedback show that the respondents were passive audiences who consume anything given without queries or the cost for contacting the radio presenters was expensive and only a few numbers could afford.

Trust in community radio	Frequency	Percentages
Trust	88	90.7
Do not trust	7	7.2
No opinion	2	2.1
Provision of feedback via radio voice calls	Frequency	Percentages
Provided feedback	2	2.1
Did not provide feedback	94	96.9
N/A	1	1.0

Table 3: Distribution of respondents based on trust of radio information and feedback provision
Source: Field data (2015)

3.3.2. Utilization of Information from Community Radio and Impacts on the Respondents

To illicit the information received by the respondents, the respondents in the study area were asked to indicate the type of agricultural information they received and how they were utilizing the information from community radio. In figure 3 below, the results showed that (52.6%) of the respondents implemented the information on how to maximize yields and get better prices, (22.7%) of the respondents implemented information on Diversification of farming for good income and (3.1%) implemented the information on produce preservation and quality of products for the markets whereas (21.6%) of the respondents did not implement any of the technologies. The percentages further reveal that (78.4%) of the respondents adopted the technologies from radio programs being aired. The results imply that innovations disseminated through community radio has high chances of adoption thus tally with (Karembu and Nguthi, 2011; Okwu et. al, 2007) findings elsewhere.

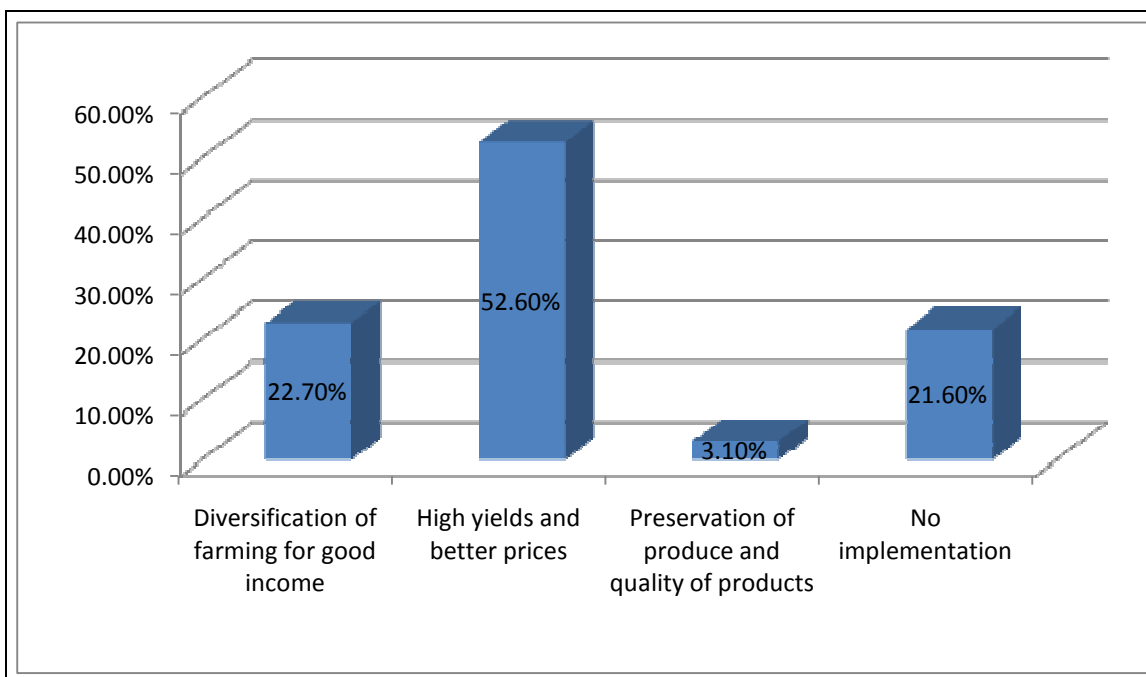


Figure 3: distribution of respondents based on information utilization
Source: Field data (2015)

To ascertain the type of market information being received by the respondents, farmers were asked whether they received market information from community radio or not. The responses are shown in table 4 below. The findings indicated that majority of the respondents (83.5%) agreed that they receive market information while (16.5%) of the respondents admitted they did not receive market information from community radio programs. The findings also revealed that (53.6%) of the respondents received information on prices of inputs, cereals and seeds available; (28.9%) of the respondents received updates on market diversity, opportunities and quality of products while (17.5%) of the respondents did not receive any market information. These findings are in line with the findings elsewhere in Africa that the demands for information among small-scale farmers are similar (Bernard et al., 2014; Spurk et al., 2013). It therefore implies that a good proportion of the respondents in the study area had access to market information disseminated via community radio.

Receiving Market information from radio programs	Frequency	Percentages
YES	81	83.5
NO	16	16.5
Type of Market information received	Frequency	percentages
Price of cereals, inputs and seed varieties available	52	53.6
Market diversity, opportunities and qualities of products	28	28.9
None	17	17.5

Table 4: Radio Agricultural Market Programs (n=97)

Source: Field Data (2015)

3.4. Effectiveness of Community Radio as a Dissemination Tool

Effectiveness in this context of the study is the ability of radio as an ICT tool in relating agricultural innovation to farmers. The study revealed that averagely 80.4% of the respondents said that the information aired via community radio was adequate, easy to understand and repeated were enough time. This outcome portrays community radio as a tool that overcome language barriers, it does not require any education to understand its messages thus reaches educated and non –educated audiences. Whereas 11.6% proportion of the respondent said that the messages were not adequate, not easy to understand and were not repeated enough and 8% of the respondents said they had no opinion whether the messages were adequate, easy to understand and repeated enough time. These findings may be attributed to the high illiteracy levels in the study area and therefore implies that the information aired on agricultural programs was not addressing the immediate need of farmers or rather the language and terms used were not simple enough to enhance understanding of the audience.

To assess the effectiveness of community radio, the study found that majority of the respondents (83.6%) agreed that community radio was effective in disseminating market information, (8.2%) of the respondents said it was less effective in disseminating market information while the (6.2%) of the respondents said it was not effective at all (see table 5). The findings suggest that majority of the respondents in the study area regard community radio to be effective in disseminating market information hence tally with (Okoth, 2015; Ariyo et al., 2013) evidences that community radio is the most effective ICT tool in disseminating agricultural technology among rural households.

Effectiveness of radio based on the following:		
Adequacy of radio messages	Frequency	percentages
Yes	73	75.3
No	16	16.5
No opinion	8	8.2
Ease of understanding radio messages	Frequency	percentages
Easy to understand	86	88.7
Not easy to understand	4	4.1
No opinion	7	7.2
Repetition of radio messages	Frequency	percentages
Repeated enough time	75	77.3
Not repeated enough time	14	14.4
No opinion	8	8.2
Effectiveness of radio in disseminating market information	Frequency	percentages
Most effective	40	40.2
Effective	43	43.4
Less effective	8	8.2
Not effective	6	6.2

Table 5: Distribution of respondents based on effectiveness of radio as a dissemination tool

Source: Field data (2015)

3.4.1. Chi-Square Test of Significance of the Effectiveness of Community Radio in Disseminating Agricultural Market Technology

Radio is an important ICT tool in providing agricultural market information which enable rural communities to make informed decision regarding farming and marketing of their produce (Ferris, 2008; Odira, 2014). In testing the hypothesis, the Chi- square test of significance of the effectiveness of community radio in disseminating agricultural market information among the respondents in the study area, in table 6 below. In table 6 below, the figures show that the calculated Chi-square value of 50 (X^2 statistics) was greater than the tabulated value of 11.35 (X^2 critical) at 0.01 percent level of probability. Thus, the null hypothesis (H_0) stating that community radio is not effective in disseminating agricultural market technology among farmers in the study area is rejected and the alternative (H_A) that community radio is effective in disseminating agricultural market technology among Suba farmers is accepted.

Rating	Rank	F _o	R + F _o	Total. O	F _e	F _o -F _e	(F _o -F _e) ²	Σ(F _o -F _e) ² /F _e	Tab. Value @ 1%
Most effective	1	40	41	81	73.4	-33.4	1115.6	15	
Effective	2	43	45	88	80.0	-37	1369	17	
Less effective	3	8	11	29	26.3	-18.3	335.0	13	
Not effective	4	6	10	16	14.5	-8.5	72.3	5	
Total		97	107					50	11.35

Table 6: Chi-Square Test of Significance of the Effectiveness of Community Radio in disseminating agricultural market technology

Key

F_o = Frequency observed

R = Rank

Total O = Total observed

F_e = Frequency expected

Σ = Summation sign

How to get $F_e = \frac{\text{total } F_o \times \text{Total O}}{\text{Total R} + F_o}$

Degree of freedom = R-1 (4-1) = 3

4. Conclusions and Recommendations

Better access to agricultural market information by smallholder farmers is a positive attribute that can facilitate better economic growth and expansion of farming to businesses which ultimately ensure agricultural development among rural communities. According to the study findings, it can be concluded that majority of respondents in the study area are poor smallholder farmers with high illiteracy levels. Community radio especially radio Ramogi is used for information updates on prices, inputs, seeds available, weather forecasts and empowerment programs thus proving it as the most available, accessible and dominant source of market information.

The effectiveness of community radio in disseminating agricultural market information among the respondents was found to be profound with (80.4%) implying that the fastest, convenient and effective method of disseminating relevant and accurate market information to mass of smallholder farmers is best with community radio thus it addresses the dilemma of poor access to market information. The study provides profound evidences that community radio is effective in disseminating agricultural innovations and market information among poor rural farmers therefore study recommends that better access and effective delivery of agricultural information need appropriate airing time, language and close interaction between agricultural stakeholders. Such a positive intervention will enhance the capacity of smallholder farmers to access better market information for economic gain.

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