

Original Research Article

Effectiveness of Selected Advisory Channels on Safe Use of Pesticides among the Small Holder Kale Farmers, A case of Kisii County, Kenya

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Abstract: Increased production has been hindered by inadequate agricultural information on pest and disease management in crops. The study was conducted to assess the effectiveness of the selected advisory channels on disseminating agricultural information on safe use of pesticides among the smallholder kale farmers. Action research design employed multistage random and purposive sampling methods to obtain responses using structured questionnaires from a sample of 160 respondents from each of the four sampling areas (wards) in two Sub-counties located in Kisii County, Kenya. Data was analyzed with the Analysis of Variance using the statistical package for data analysis (SPSS Version 19). The results obtained indicated that highest number (38.1%) of the respondents required the information on safe use of pesticides while the lowest number (13.1%) required information on financial management. Majority of the respondents (60%) believed that the information obtained on safe use of pesticides led to increase in yields and only 6.9% believed that it only contributed to safe and proper use of pesticides. There was no significant difference ($F = 2.139, p = 0.112$) in farmers' perception on the effectiveness among the selected advisory channels. The study recommends that the government needs to extend training to the pesticide dealers, farmers and other stakeholders on safe use practices of pesticides to facilitate pest and disease management in kale production.

Keywords: Advisory Channels, Small Holder Farmers, Safe-use Practices, Pesticides.

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1.0 INTRODUCTION

Agriculture plays a pivotal role in economic growth through its contribution to the Gross Domestic Product (GDP). The increased production among the smallholder farmers has been hindered by inadequate dissemination of agricultural information (Adolwa *et al.*, 2012). Pesticide use is considered one of the most effective methods of increasing marginal production in semi-intensive farming systems (Mengestie *et al.*, 2015; Rahman, 2013; Jin *et al.*, 2017). However, the devolution of agriculture brought limited subsidies to counties, making it difficult for County extension officers to remotely disseminate the available information on safe use of pesticides. In Kenya, most farmers rely on private extension services which are sometimes unreliable, unaffordable, inaccessible and poorly regulated in addition to their limited use of essential technologies to reach the target population (Arumapperuma, 2008). According to Murage *et al.*, (2012), the effectiveness of an advisory channel

depends on the number of farmers reached and the influence of the information on the farmer's decision to adopt a new technology. For instance, if the advisory channel deems to be effective, the information must suit the needs of the user and be relayed in the preferred language (Barbara & White, 2001). The quintessential agricultural information is crucial to guide decision making especially on the safe use practices (Chisita, 2012). Knowledge availability creates the opportunities to respond to social-economic challenges by allowing people to learn new skills and change their attitudes (Ajayi and Gunn, 2009). Agwu *et al.*, (2008) identifies various advisory channels through which the agricultural information can reach the farmers. The information received through different advisory channels will result in knowledge acquisition for adoption of new technologies (Murage *et al.*, 2012). Thus, several advisory channels, such as the agricultural extension officers and other government agencies have been employed to disseminate knowledge on farming

technologies to farmers to improve the agricultural productivity and the farmer’s livelihoods (Muyanga and Jayne, 2008; Solomon, 2011). Ntow *et al.*, (2008) reported that the training programmes organized for farmers are crucial in improving their knowledge, practices and attitudes towards safe use of pesticides in agricultural production which have made them the most popular advisory channel promoting the adoption of safe use of pesticides in kale production. Pesticide sellers also play an important role in relaying the agricultural information to farmers (Poullisse, 2007), and have been recognized as the most likely advisory channel for disseminating agricultural information probably due to their proximity to the farmers (IFAD, 2006). Most pesticide sellers are agro-input dealers who also sell other farm inputs and share knowledge on improved production practices with small scale farmers (CNFA, 2009). However, previous studies indicate that agro-input sellers faced with numerous challenges, including limited skills and knowledge to disseminate the agricultural information effectively (Isherwood, 2004). Due to a high demand for agricultural information and limited capacity of extension services, farmer trainers have emerged as another advisory channel (Scarborough *et al.*, 1997). Some studies indicate that most farmers depend on their fellow farmers as their primary sources of agricultural information. In this scenario, a farmer who has acquired both knowledge and experience conducts a field experiment to train other farmers the practical skills (Braun and Hocde, 2000). Acquisition of Agricultural information through farmer trainers has proved the most

efficient channel for disseminating farming technologies (Place *et al.*, 2005). Kale is an important vegetable crop which provides income and employment among the small scale farmers. The crop is frequently attacked by pests and diseases necessitating the use of pesticides to scale up its production. Previous studies indicate that continual access to agricultural information and the knowledge on safe use of pesticide practices is a fundamental tenet for improved kale productivity. However, few studies have focused on the effectiveness of various advisory channels used in disseminating agricultural information to kale farmers. Hence, the study assessed the effectiveness of selected advisory channels in dissemination of information on safe use of pesticide practices among kale farmers.

2.0 MATERIALS AND METHODS

The study was conducted in Bobasi and Kitutu Chache North Sub-Counties, which are geographically located in Kisii County, Kenya between latitude $0^{\circ} 40' 38.4''$ S and longitude $34^{\circ} 34' 46'' 61''$ E (Figure 1). Agriculture dominates the county’s economic activities with approximately 75% of arable land containing red volcanic soils which are best suited for vegetable farming under different ecological zones (Kisii County Integrated Development Plan 2018-2022). The County experiences a highland equatorial climate with a bimodal rainfall (1500 ± 100 mm) which is spread over long and short rain seasons between March and June and the September to November respectively. The average temperatures range between 18° C and 25° C.

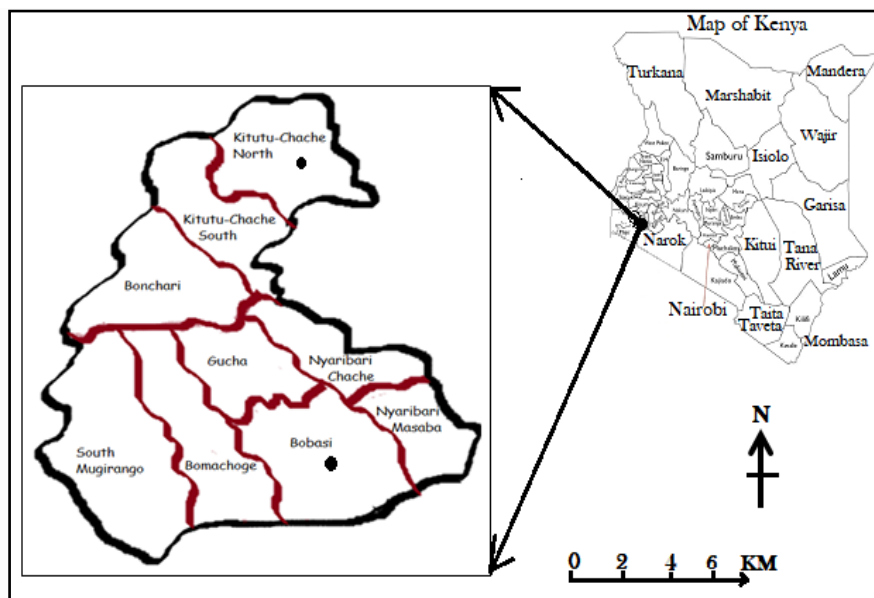


Fig-1: The Map of Kisii County showing Location of Sampling areas at Bobasi and Kitutu-Chache North Sub-Counties. Modified from IEBC, 2007

The study used action research design which employed multi-stage random and purposive sampling techniques to improve the processes and outcomes followed by the evaluation (Koshy, 2005; Schmuck, 2006). Structured questionnaires were randomly

administered among 30 kale farmers during a pilot study in one of the wards which was not sampled. A random sample of 160 kale farmers was picked from each of the four Wards in two the Sub-counties, Bobasi and Kitutu Chache North depending on their advisory

channel and subjected to a pre-test on their knowledge on safe use practices as recommended by Kathuri and Pals (1993) and Denscombe (2007). After training, a post-test was conducted to establish the level of knowledge on safe use of pesticide practices. Descriptive survey method was used to determine the advisory channel and pesticide use among kale farmers and also to assess the level of knowledge of respondents on safe use of pesticides. This research also applied qualitative and quantitative approach to describe the farmers' perception on the advisory channels they use to receive the agricultural information on pesticide use in kale production and the impact of the main information received. The respondents were asked to indicate the type of agricultural information they would require to improve kale production. The responses on farmer's perception on effectiveness of the advisory channels on safe use of pesticides were rated on a five point likert scale ranging from 1 (indicating the not effective) to 5 (indicating the most effective advisory channel). The usefulness of the advisory channels in

disseminating information were also ranked on a five point Likert scale where 1 indicated the advisory channel was not useful and 5 was very useful in that order. Data was analyzed using descriptive statistics and the Analysis of variance (ANOVA) with SPSS Version 19 (IBM Inc.) and the differences between the selected advisory channels were considered statistically significant at $p < 0.05$.

3.0. RESULTS AND DISCUSSION

3.1 Agricultural Information Required by Kale Farmers

The highest number (38.1%) of the respondents required the information on safe use of pesticides whereas 20% of the respondents required information on market prices. Few respondents (14.4%) required information on fertilizer use and soil and water management equally while a slightly lower number (13.1%) required information on financial management (Figure 2).

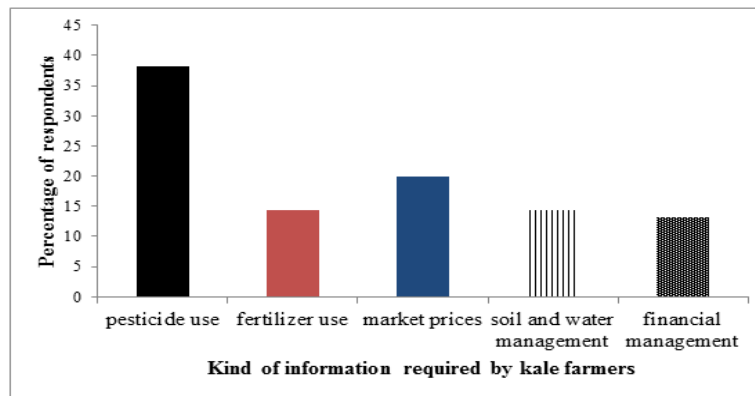


Fig-2: Agricultural Information Required by Kale Farmers

This could be due to the fact that pesticides directly affected kale production in terms of quality and yield. Further, the respondents required relevant information such as soil fertility improvement, input availability and cost of inputs prior to planting and crop management practices such as pest and disease control after planting (Ekoja, 2004; Rao, 2004; Ratnam *et al.*, 2005; Tiwari, 2008).

3.2 Contribution of the Selected Advisory Channels on Safe Use of Pesticides

Sixty percent of the respondents believed that the information received on safe use of pesticides led to increase in yields, while 25.6% resulted to higher quality of produce, whereas only 7.5% believed that it resulted to lower production cost and 6.9% that it only contributed to proper use of pesticides (Figure 3).

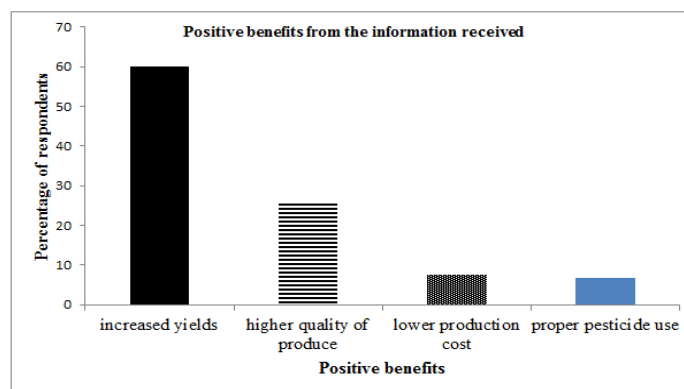


Fig-3: Positive Benefits from the Information Received by Kale Farmers on Safe Use of Pesticide Practices

This shows that despite the training of respondents on safe use of pesticides, implementation levels were still very low and there was need for additional and continuous trainings on safe use of pesticides using different advisory channels to boost the knowledge of the respondents.

Agricultural extension officers were the major source of information with the highest number of respondents (39.4%) followed by pesticide sellers and farmer trainers with 33.8% and 22.5% of the respondents respectively. Only 4.4% of the respondents received information from other advisory channels such as radios, television and newspaper (Figure 4).

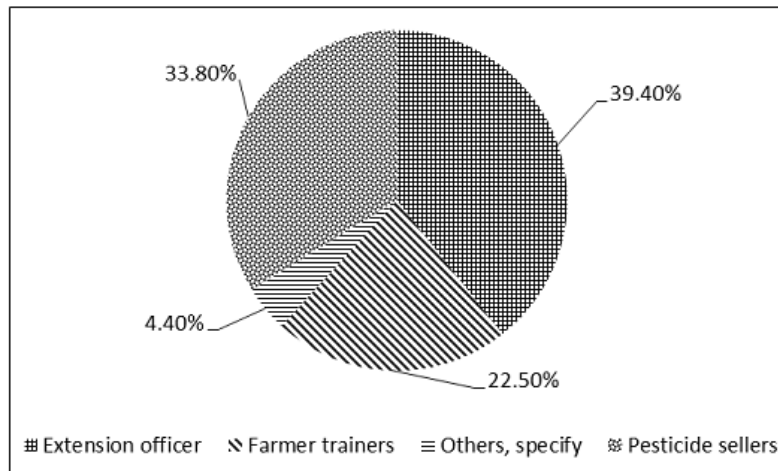


Fig-4: Advisory Channels used to Disseminate Information to Kale Farmers on Safe Use of Pesticide Practices

These results corroborate with the findings of Lekei *et al.*, (2014) who reported that the agricultural extension officers (38.6%) and the farmer trainers played a major role of disseminating information to farmers in Tanzania. Rahman *et al.*, (2013) also reported that the farmer trainers also disseminated information on selection and safe use of pesticides.

3.3 The Effectiveness of Different Advisory Channels on Safe Use of Pesticides

The farmers perceptions on the effectiveness of different advisory channels indicated that the agricultural extension officers with 53.1% (summation of effective and very effective frequencies) was the most effective advisory channels followed by farmer trainers and pesticide sellers with 52.5% and 45.7% respectively (Figure 5). This shows that farmers are willing to rely on different advisory channels especially after the decline of government agricultural extension services (Okonya and Kroschel, 2015). This result agree with the findings of Muhammad *et al.*, (2002) who reported that fellow farmers are involved in disseminating information on safe use pesticides in addition to other advisory channels such as advertisements from media, chiefs' Barazas and common interest groups. However, the information on safe use of pesticides was primarily disseminated by agricultural extension officers, pesticide dealers and farmer trainers. This shows that having contact with the farmers during the trainings enhanced the dissemination of information on safe use of pesticide practices.

Similar findings have been reported from other related studies such as Lwoga *et al.*, (2011), who found out that the agricultural extension officers effectively disseminated the information on new agricultural technologies from research institutions to the farmers through trainings although farmers were not satisfied with the frequency of their visits. Nevertheless, pesticide sellers also played a crucial role in disseminating information on the safe use of pesticides when farmers visit the agro-dealer shops to purchase pesticides, and other farm inputs providing them an opportunity to share and disseminate the information, skills and knowledge on safe use technologies under their possession. However, Goodwin (2002) reported that the major downside of relying on agro-dealers as the major advisory channel was little practical experience on interacting with the smallholder farmers and lack of adequate information on plant health issues. Due to high interaction level with the farmers, farmer trainers is the most effective method in information dissemination when there is need to cover a wide range of target groups (Franzel *et al.*, 2015).

Usefulness of the Selected Advisory Channels in Disseminating Information

The study showed that 55 % of the respondents considered extension officers as the most useful advisory channel in disseminating information on safe use of pesticides, followed by the pesticide sellers at 50.6% and finally the farmer trainers at 47.5% respectively (Figure 5).

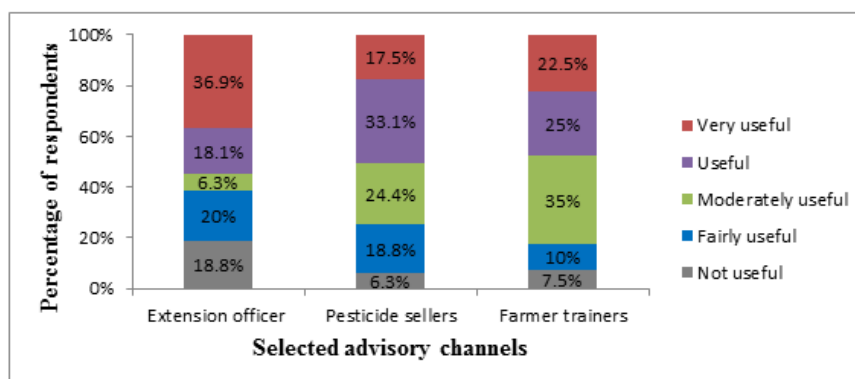


Fig-5: Usefulness of the Selected Advisory Channels on Safe Use of Pesticide Practices in Kale Production

However, there was no significant difference ($F = 0.28$, $p = 0.752$) in farmers' perception on usefulness among the selected advisory channels. The highest average for the responses on usefulness of the advisory channels was that of farmer trainers 3.45 followed by pesticide sellers and extension officers with 3.3687 and 3.3437 average responses respectively. This suggests that all advisory channels can be considered useful in disseminating the information on safe use of pesticides in kale production.

4.0 CONCLUSION AND RECOMMENDATIONS

Availability of information on safe use of pesticide practices has a significant contribution on the safe use of pesticides among the smallholder kale farmers in Kisii County, which has led to pests and disease control in kale production. The study also established that there was no significant difference in the effectiveness among the three selected advisory channels in disseminating information on safe use of pesticide practices. This implies that all the selected advisory channels disseminated important information which contributed to safe use of pesticides for effective management of pests and diseases among the kale. The study recommends that the government needs to extend training to the pesticide dealers, farmers and other stakeholders on safe use practices of pesticides to facilitate pest and disease management in kale production. In addition to chemical pest and disease control, agricultural extension services should explore and train farmers on integrated pest management technologies in kales.

Conflict of Interest

Authors declare no conflict of interest

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