Information needs, sources and access by small-scale horticultural crop farmers in Tanzania: a case of Morogoro urban district

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Research Article

Keywords: Information needs, information sources, information access, small horticultural farmers, horticultural crops, Tanzania, Morogoro urban.

Posted Date: October 19th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2159841/v1

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Abstract

This study investigates Morogoro Urban horticultural farmers’ information needs, sources and access, using 112 respondents interrogated through questionnaires, observation and interviews. Farmers needed information on sowing/harvesting time, disease and pest control, erosion control, harvests storage, produces markets. Friends/colleagues ranked as important information source, followed by Extension Officers, libraries, Internet, friends/peers, cooperatives, Nanenane festival, radio and newspapers. Challenges include unavailability of extension officers, long distance to/from libraries. Recommends equipping small-scale horticultural crop farmers will add value to information exchanged through interpersonal relationship. Employing more skilled extension officers, and use of modern ICT to improve horticultural farmers’ information access is also emphasized.

Introduction

Horticulture defined as the art of gardening or the cultivation of fruits, vegetables and flowers (Verheiji, 1982), plays a substantial role for the nation economy through employment and income generations including the youth, women and low income society groups (Ng’atigwa et al., 2020). This is because, unlike the traditional farming, horticulture farming is characterized by high productivity per unit space, low capital per unit production, low energy consumption and low marketing cost per unit of product (Mlozi et al., 2004; Ng’atigwa et al., 2020) making it potential for pro-poor growth. Horticulture produce are also essential for improving the dietary balance as well as medicinal values (Singh and Malhotra, 2011). Growing of fruits and vegetables - provides critical nutrients for a balanced diet, improving livelihoods - by increasing farmer profits and diversifying nutrient-rich diets, and - as medicinal herbs that protect against many diseases by enhancing self-protective mechanism through many immunological advantages (Singh and Malhotra, 2011). On the other hand, flower farming has an important source of export economy in a number of African countries including South Africa, Zimbabwe, Kenya, Tanzania and Uganda (Haug et al., 2008). Singh and Malhotra (2011) thus posit that, cultivation of horticultural crops plays a vital role in the prosperity of a nation and is directly linked with the health and happiness of the people.

In order to bring substantial development in the horticultural sector, access to timely, reliable, and relevant horticultural information is critical (Kaske et al., 2018). Information, defined as knowledge in communicable form, is recognized as one of the main requirements for development that everybody needs on a daily basis to be able to carry out any activity (Masele, 2019). Information is currently regarded as a factor of production just like labor, capital, and land (Rao, 2007). It is a tool used to reduce uncertainties in inactive action selection and is the necessary input in decision-making processes (Solano et al. 2003). According to Elly and Silayo (2013), farmers require proper information in order to plan for their activities, make choice of the inputs and eventually on when and where to sell their products. Studies (Ali and Kumar, 2011; Siyao, 2012) also assert that horticultural farmers’ decisions are greatly influenced by the amount of information that is available to them. To that extent Babu et al. (2011) affirm that there is a direct relationship between availability of information and agricultural development. Thus
effective access to relevant information is essential for improving agricultural productivity and bringing about social and economic change (Natsa, 2013; Salau et al., 2013; Elly and Silayo, 2013) in African countries including Tanzania (Lwoga et al., 2010).

Although in most of the developing countries extension services are considered as a major source of information to the farmers (Msofe et al., 2018), relying on extension agents as main sources of information has also contributed to a delay in innovation diffusion since most farmers do not meet the extension agents for long periods of time (Angello et al., 2016). This is also noted by Wakhungu (2010) who notes that sometimes farmers do not get information specific for their horticultural activities due to various reasons one of them being failure to meet the extension agents. The situation hinders horticultural productivity and reduces their contributions to the horticulture sector and to the broader economic and social development goals.

Understanding of the information needs [a recognition of a person that knowledge he or she possess is inadequate to satisfy a goal (Donald, 2007)] related to horticultural production is important for horticultural development. According to Sense-making theory (SMT) by Dervin (1992), the information must be relevant to an individual before he/she decides to pay attention to evaluate and use it. Unless the information is considered relevant to a user, it will be ignored (Sualman & Jaafar, 2011). Zoellner (2010) thus urges in line with the uses and gratifications theory (UGT) for information professionals to have a broader understanding of the user groups information needs to determine if, how, and by what means, they should develop and package information to meet their needs.

It should be noted that farmers' information needs have increased now than ever before due to the extent of sophisticated of the globalized market we are in, enabled by the advancement in the level of ICT and the web. Besides, the reliability of information needs identified some years ago may no longer be wholly relevant for today's knowledge society (Herman, 2004). Additionally, Horticultural farmers' lack of information is a paradox that continues to debilitate the efforts to improve horticulture production in most of African countries. Therefore, it is imperative that the required horticultural information reaches the intended users in a most convenient, timely manner and at affordable costs to ultimately meet their needs (Salau, et al., 2013; Elly and Silayo, 2013).

Like other horticultural farmers in Tanzania, horticultural farmers in Morogoro face a number of informational related problems that need to be addressed (Benard, et al., 2014). Yet, studies conducted to investigate information needs and the respective sources for small scale horticultural farmers are limited. It was from this motive this study was formulated to investigate the information needs, sources and access by the small scale horticultural crop farmers in Morogoro Urban. Specifically: the study examines information needs of small scale horticultural farmers; examines the sources of information for small scale horticultural farmers in Morogoro Urban; and it examine factors that hinders access to and use of information by small scale horticultural farmers in Morogoro Urban; and, it finds out ways of enhance horticultural farmers’ access to and use of information in Morogoro Urban.
Literature Review

The Sense making theory (SMT)

Sense-Making theory as invented by Brenda Dervin in 1980, proposes that information is not something that exists apart from human behavioral activity (Dervin, 1992). Rather, it is ‘created at a specific moment in time-space by one or more humans (Dervin, 1992). Sense making is implemented in a situation in time and space, which identifies the differences between the contextual situation and the desired situation; an outcome, that is consequences of the sense-making process and a bridge, that is some means of closing gap between situation, a gap bridge and outcome. Dervin has expressed these elements in terms of a triangle: situation, Gap/Bridge and outcome (Patel et al., 2021). The strength of Dervin's model lies partly in its ability to reveal the nature of a problematic situation, the extent of information services required to bridge the gap of uncertainly, confusion or whatever and nature of the outcomes from the use of that information (Patel et al., 2021). It assets that, information seeking is a result of some motives an individual has that determines how and what type of information to be selected at a particular time (Sualman & Jaafar, 2011). The theory has widely been applied in determining the information seeking and usage; it is considered strong in explaining relationships between situational factors and efforts toward fulfilling information needs and information seeking (Sualman & Jaafar, 2011; Abolafia, 2010). To this end this study found the theory useful in explaining the information needs, sources and access by small-scale horticultural crop farmers in the study area.

Uses and gratifications theory (UGT)

Uses and gratifications theory (UGT) as invented by Blumler and Katz in 1940s is an approach to understanding why and how people use certain types of media, what needs do they have to use them, and what gratifications do they get from using them (Blumler and Katz, 1974). The UGT is an audience-centered approach to understanding mass communication. It focuses on "what do people do with media?" (Menon, 2022). According to UGT users take an active part in the communication process and are responsible for choosing media to meet their desires and information needs to achieve gratification. It assumes that the user has alternate choices to satisfy their need. This theory would then imply that the media compete against other information sources for viewers' gratification (Katzet al., 1973). Zoellner (2010) argues that a broader understanding of the pressing realities of user groups and everyday information that addresses those realities will enable information professionals to determine if, how, and by what means, they should develop and package information to meet the needs of their service populations and communities. This study therefore considered this theory useful in explaining the phenomenon under investigation on information needs, sources and access by small scale farmers in Morogoro.

Information and information needs for Horticultural Production

The role of information in all spheres of life is immense to facilitate decision making and engendering progress (Evans, 2001). Studies (Kaske, 2020; Kishore & Gupta, 2011; Lwoga et al, 2010) highlight the
importance of information in agricultural development and its potential in improving the efficiency. Agricultural information is useful for farmers because it helps them to overcome their inadequacies in the knowledge of certain basic practices that may include technical, marketing, social, and legal agricultural information (Owolade & Kayode, 2012). Kishore & Gupta (2011) view information as one of the key inputs in agriculture. However, for information to be desired for any endeavor including horticultural farming, must be able to meet the seekers’ information needs. By information need it refers to basic requirement for information that is of value for one’s life, private or social. Case (2002), defines information need as recognition that personal knowledge is inadequate to satisfy a goal that needs to be achieved. Borlund and Pharo (2019) refer information needs to as fact that a person wants, needs or expects in an information source in his/her pursuit to make a decision or complete a task. Once these information needs or questions are formulated, persons speculate on what type of information can meet these questions.

Yet information needs are not permanent, - they change with time and activities to be undertaken. Horticulture as opposed to traditional field agriculture is information intensive, and the information needs greatly vary from time to time and from one seeker to another. Studies (Lesaoana-Tshabalala 2003; Meitei and Devi 2009; Matovelo, Msuya and de Smet 2006) have also confirmed that the information needs of small-scale farmers are personal and location specific. This means although there might be there a number of studies on agricultural information needs in Tanzania, inexistence of information on horticultural production calls for need for updating farmers’ information needs in order to accommodate changes in the farmers’ environment (Kalusopa 2005). Although recent studies were carried on enhancing competitiveness of horticultural industry in Tanzania and that it points out on the role of information to bettering production, improved access to market, post-harvest techniques, and financial opportunities (Ng’atigwa et al., 2020; Msafiri and Mwombela, 2021) specific horticultural information needs, sources and access by women farmers in Morogoro urban are unclear. In fact, information needs are context and intended users specific (Salau, et al., 2013; Elly and Silayo, 2013), calling for need for this study.

Although farming is a profession that depends on the constant flow of information, most farmers find it difficult to identify when they require information (Kaske (2020). Kaniki (2001) notes that information needs can be recognized by the information seeker or by the information expert on behalf of the information seeker, or the two may need to work together towards “disentangling” and establishing the actual information needs. By assessing those needs, the service providers are able to understand and design more effective information systems that would enable the farmers to access relevant information and knowledge which would solve their problems and improve their farming activities. Studies (Lwoga et al., 2010; Singh and Malhotra, 2011; Denyes, 2014) asserts that for smallholder farmers to make the most of their harvests they need access to a range of information that can help them decide when best to buy inputs or sell their yields, saving them time and money; plan for weather changes that can help them capitalize on rainfall or protect plants against frost; pick the best-yielding seed varieties; and distinguish between disease and pests and respond appropriately.

**Importance of access to information sources related to horticultural farming**
Existing empirical evidences indicate that, information has not achieved successful agricultural development in most developing countries, and rural poverty still prevails. Chailla (2001) asserts that for information to increase knowledge for maximum farm yields, it must be available, relevant and accessible for use at the right time. In fact, the availability of information for development is not enough to bring about changes; it must be accessible (Chailla, 2001). Where needed information is available but not accessible at the right time, it is as good as nothing. Kaske (2020) affirms that inefficient access and dissemination of agricultural information can negatively affect agricultural development. The argument is also supported by other scholars such as Koller et al. (2001) and Powell & Smith (2003) who assert that people cannot use information in whatever format it is unless they have access to it. Study findings by Hoang et al. (2022), on factors affecting the use of agricultural information by Vietnamese cereal farmers, using regression analysis show that access to the sources to information such as Internet and television, information obtained from preferred traders, the Commune Peoples’ Committee, extension workers, cooperatives, the farmers’ union and input suppliers significantly affected farmers’ use of agricultural information.

According to Mathiesen (2014), a person has access to information when he/she has the freedom or opportunity to obtain, make use of, and benefit it. Mathiesen (2014) further conceived “5 facets of information access” where he expounds that, for information to be accessible; it must meet the five facets which are: (1) availability, (2) reachability, (3) findability, (4) comprehensibility, and (5) usability. Correspondingly, other horticultural stakeholders including researchers and policy makers can only do optimally, if they are accessible to right information as an important input in reaching sound decisions. Yet, Svensson, and Yanagizawa (2009), considered inadequate access to information, or situations of asymmetric information, as a ‘norm’ in developing countries. Magesa et al. (2014), add that poor farmers are faced with many challenges associated with non-supporting factors such as environment and infrastructure such as absence of electricity, poor roads conditions, or inability to afford internet bundles, and information searching illiteracy when trying to develop access to information. It may also be due to failure to access communication media like TVs, computers and the Internet or information provided by some media like TVs, newspapers and radio being not relevant to a particular region farmers’ needs. For example, these media may publish agricultural information covering regional and national markets which does not interest rural farmers as they are not customized to suit their needs (Magesa et a., 2014). In other words, information becomes valuable and therefore easily accessible if it is location-specific, timely and accurate, dynamic, and locally available and in a language understood by all of the rural population.

**Methodology**

This study was conducted in Morogoro Urban district. Morogoro Urban lies at latitude 37 East of the Greenwich meridian, and is among five councils of Morogoro region, others are Kilosa, Kilombero, Ulanga and the new Mvomero District. Morogoro Urban is at the center of these four Districts. The Morogoro Urban district is divided into 19 wards namely, Mwembesongo, Mjimpya, Kingo, Kingolwira, Uwanja wa Taifa, Saba Saba, Kiwanja cha Ndege, Mzinga, Mlimani, Mjimkuu, Bigwa, Kilakala, Kichangani, Boma, Sultan Area, Kihonda, Mazimbu, Mafiga and Mbuyuni. Morogoro Urban has an area of 260sq.kms. The
current population of the Urban stands at 315,866 according to the population census of 2012, of which
151,700 are men and 164,166 are women (National Bureau of Statistics Tanzania, 2012). While urban
horticulture production is considered as a survival strategy in Tanzania, Morogoro is advantaged when
compared to numerous other regions in Tanzania. Being endowed with fertile land, numerous water
sources, irrigable areas and low population density, makes it attractive area for horticultural investments
for pro-poor growth. Available data indicated that, Morogoro region and Morogoro district in particular
accounts for about 2% of national production of horticulture, with vegetable growing offering about the
only major possibility for a cash crop (Lynch, 1999). Yet, while small scale farming comprises the
majority of horticultural production in Tanzania, scant studies have investigated on small scale
horticultural farmers’ information needs, sources and access. Understanding of information needs,
sources and access by small-scale horticultural crop farmers has positive implications for the
improvement in livelihood of the farmers and country’s economy.

The population of this study comprises of small scale horticultural farmers and agricultural extension
officers. These were considered as information rich on the topic under study. A convenience sampling
technique was used to select a sample of 115 respondents (112 small scale farmers and 3 agricultural
extension officers), being a response rate of 62.2% of the intended 180 respondents. The reason for using
this technique is that, horticultural crop production farmers are always busy with their activities, such that
it easily to conveniently select one as respondent. For the case of small-scale horticultural crop-
production, farmers in Morogoro urban are situated within the Ngerengere, Kikundi and Kichangani river
basins. So it was easier to be given questionnaires and easy to administer. This technique was also
considered cheap and time saving (Kothari, 2019). Purposive sampling was also used to select the 3
agricultural extension officers (believed to be information rich respondents) from Mazimbu, Kichangani
and Mbuyuni wards which are horticultural crop production areas.

Basing on the nature of a particular problem and on the time and resource available along with the
desired degree of accuracy, a triangulation was used to combine methods. The used methods included
questionnaires, interview, observation as well as focusing group discussions. Triangulation was opted
because each method has its own strength and weakness so that this approach could generate
confidence in arriving at conclusion because data collection complimented to each other. Open and close
ended questionnaires were used as the main data collection from the small-scale horticultural crop
farmers. Focus group discussions with six groups of six to ten farmers from Ngerengere, Kikundi and
Kichangani (two from each) was held to discuss issues related to information needs, sources of
information, access to the mentioned sources, challenges they face and suggestion for improving access
to relevant and up-to-date horticultural farming activities. On the other hand, the interviews were
conducted with the three agricultural extension officers (AEOs). AEOs were selected for in-depth inquiry
during the in-depth interview based on their possession of rich experience and information on the subject
of investigation. Observation was used to supplement information given by the small-scale horticultural
crop farmers and extension officers. The researcher visited and spontaneously observed onsite
horticultural farming activities and the libraries including other information sources such as radios,
magazines, newspapers, television etc. used for small scale horticultural farming in the study area. This
particular method was able to provide information that could not be offered directly from respondents. To ensure validity of instrument, a pilot study (questionnaire pre-test) was conducted in order to clarify any instrument ambiguity problems. The finding from the pilot study was the basis for modifying questions and improving clarity. Together with triangulation data gathered was considered valid (Aina, 2002). Triangulation is strong in data gathering; it validates other data sources and focuses on reality.

Data gathered from questionnaires, interviews and observations was organized in broad themes, labeled, coded described and analyzed basing on the objectives of the study. Data collected through questionnaires was analyzed using both descriptive and inferential statistics using SPSS Version 23, while content analysis was used for analysis of collected qualitative information.

Findings And Discussion

Demographic information

A total of 112 respondents equivalent to 62.2% of the respondents successfully filled and returned questionnaires. As per Table 1, the age category of respondents shows that 14.3% of respondents were aged below 20 years, 42.9% aged between 20-29 years, 19.6% aged between 30-39 years, and 17.9% were aged between 40-49 years, while 5.4% were aged 50 years and above. The responses show that most respondents were aged between 20 and 49 years. This implies that the respondents are in economically productive age which is between 16 to 64 years. (Skirbekk, 2008; Ishibashi, 1998) The findings further indicate that all respondents had attained formal education, ranging from primary education to postgraduate education. The findings show that 48.2% of respondents had attained Primary education, 16.1% respondents had attained secondary education, 3.6% had attained adult education, and 16.1% had attained first degree, while 16.1% had attained postgraduate education. This means that all the respondents have adequate capacity in seeking information compared to people who have never attended formal education. Understanding the education level on the respondents would enable repackaging of agricultural information in Swahili and English languages (books, leaflets etc.) so can be used successfully by the farmers in the study area.

Table 1: Demographic profile of respondents
The study findings also reveal that the respondents engaged in horticultural production, in which they cultivated the following crops: amaranthus, sweet potato leaf, onions, tomato, Chinese cabbage, sweet potato roots, cassava, oranges, water melon/cucumber, pumpkins, peas, guava, spinach, pears, cabbage, pineapples, pawpaw, okra, mangoes, pepper, eggplants and carrots. This was also confirmed by the researcher during his visits to the peasants’ farms.

Findings basing on research questions

The findings presented in Table 2, Table 3 and Table 4 are based on research questions. Both descriptive and inferential statistics analysis are presented. The table summarizes the descriptive analysis on information needs by respondents, information accessible to respondents, sources of horticultural farming information, challenges facing horticultural farmers in access to information, and suggestion on strategies to improve access to information on gardening. The responses given are non-mutually exclusive responses that allowed one respondent to give more than one response at the same time for one question.

Table 2: Findings based on research questions
<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Item description</th>
<th>Frequency</th>
<th>Percentage (%)</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horticultural Information needs by respondents</td>
<td>Information on disease and pest control</td>
<td>78</td>
<td>70</td>
<td>47.3</td>
<td>16.5</td>
</tr>
<tr>
<td></td>
<td>Information on prices</td>
<td>54</td>
<td>48</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Information on markets</td>
<td>50</td>
<td>45</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Information on storage of harvests</td>
<td>40</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information on time of sowing and harvesting</td>
<td>36</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information on erosion control</td>
<td>26</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total (N)</strong></td>
<td><strong>112</strong></td>
<td><strong>100</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Accessible to Respondents</td>
<td>Information on weed control</td>
<td>56</td>
<td>50.0</td>
<td>35</td>
<td>18.6</td>
</tr>
<tr>
<td></td>
<td>Information on use of fertilizers</td>
<td>54</td>
<td>48.2</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Information on pest control</td>
<td>48</td>
<td>42.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information storage of garden harvests</td>
<td>26</td>
<td>23.2</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Information on processing</td>
<td>18</td>
<td>16</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Information on markets</td>
<td>8</td>
<td>7.1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Total (N)</strong></td>
<td><strong>112</strong></td>
<td><strong>100</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horticultural Information sources used</td>
<td>Friends</td>
<td>58</td>
<td>52</td>
<td>33.7</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>Agriculture Extension officer (AEO)</td>
<td>52</td>
<td>46</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Nanenane festivals</td>
<td>48</td>
<td>43</td>
<td></td>
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<tr>
<td></td>
<td>TV</td>
<td>45</td>
<td>40</td>
<td></td>
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<td></td>
<td>Radio</td>
<td>40</td>
<td>36</td>
<td></td>
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<tr>
<td></td>
<td>Newspapers</td>
<td>32</td>
<td>29</td>
<td></td>
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<td></td>
<td>Cooperatives</td>
<td>24</td>
<td>21</td>
<td></td>
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<tr>
<td></td>
<td>SNAL</td>
<td>18</td>
<td>16</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>National/regional/district library</td>
<td>16</td>
<td>14</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Internet</td>
<td>8</td>
<td>7.1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Library</td>
<td>2</td>
<td>1.8</td>
<td></td>
<td></td>
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<tr>
<td>Challenges facing Horticultural farmers in Access to Information</td>
<td>Total (N)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Lack of library</td>
<td>66</td>
<td>59</td>
<td>27.4 19.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of visits by agricultural extension officer</td>
<td>30</td>
<td>27</td>
<td></td>
<td></td>
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<tr>
<td>Failure to get information on time</td>
<td>28</td>
<td>25</td>
<td></td>
<td></td>
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<tr>
<td>Long distance from agricultural library</td>
<td>24</td>
<td>21</td>
<td></td>
<td></td>
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<tr>
<td>Library has shortage of materials</td>
<td>8</td>
<td>7.1</td>
<td></td>
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<tr>
<td>Outdated library materials</td>
<td>28</td>
<td>7.1</td>
<td></td>
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<td></td>
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<tr>
<td>Libraries have little information on vegetable growing</td>
<td>8</td>
<td>7.1</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Suggestion on how to improve access to information on gardening</th>
<th>Total (N)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural extension officers should be closer to farmers</td>
<td>32</td>
<td>57</td>
<td>17.8 10.1</td>
</tr>
<tr>
<td>Public libraries should be equipped with adequate materials on gardening</td>
<td>24</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>The number of extension officers should be increased</td>
<td>24</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Infrastructure (roads, electricity, internet networks) should be extended to the rural areas</td>
<td>10</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Seminars to sensitize farmers should be organized more frequently</td>
<td>9</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Mass media should increase coverage on better farming methods</td>
<td>8</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

| Total (N) | 112 | 100 | 27.4 19.4 |

**Information needs of small scale horticultural farmers**

The first research question of this study sought to assess information needs of horticultural farmers in the study area. The findings as presented in Table 2, show that 70% of the respondents needed information on disease and pest control, followed by 48.2% of the respondents who needed information on prices, then 44.6% of the respondents who needed information on markets, followed by 35.7% of the respondents who needed information on storage of harvests, then 32.1% of the respondents who needed information on time of sowing and harvesting, and lastly 23.2% of the respondents needed Information
on erosion control. A further problem through focus group discussion revealed that these types of information needed are directly related to their day to day horticultural production activities. For example, ensuring that farmers’ efforts towards expansion of horticultural production are not hampered by the outbreaks of diseases and pests is important, while information on good prices motivates increased production by the farmers for more profits.

**Information accessible by horticultural farmers**

The respondents were further asked to state the type of information that was accessible to them. The findings as presented in Table 2, show that 50.0% of the respondents had access to information on weed control, 48.2% of the respondents had access to information on use of fertilizers, 42.9% of the respondents had access to information on pest control, 23.2% of the respondents had access to information on storage of garden harvests, 16.1% of the respondents had access to information on processing, while 7.1% of the respondents had access to information on markets. Information on weed control has been mentioned as the mostly accessible type of information while information on markets is the least available and accessible information, yet very important so as to enable farmers know where to sell their crops for better prices.

**Sources of information for horticultural farmers in Morogoro urban**

Investigation on sources of information for horticultural farmers in Morogoro urban indicates sources of information for horticultural farmers as presented in Table 2, show that majority of respondents (51.8%) depended on their friends and peers for horticultural farming than any other source, followed by 46.4% of respondents who get information from extension officers, then 42.9% of respondents get information from Nanenane festivals. 35.7% of respondents get information from radio, followed by 28.6% of respondents who get information from newspapers, then followed by 21.4% of respondents who get information from cooperatives. 16.1% of respondents get information from Sokoine University National Agriculture Library (SNAL), while 14.3% of respondents get information from National/regional/district library, while 7.1% of respondents get information from Internet, and lastly 1.8% of respondents get information from library where they work.

**Factors that hinder access to and use of information by horticultural farmers in Morogoro urban**

The respondents were asked to provide information on factors that hinder them to access and use of information. The findings as presented in Table 2, show that majority (59%) indicated lack of library, followed by 26.8% of respondents who mentioned considered lack of visits by agricultural extension officer; with majority (41%) reporting to have not been visited by agricultural extension officer. Among others infrequency in visits were explained by inadequate number of extension officer, being poorly equipped with transportation means that suits the poor roads conditions to meet farmers. Another challenge mentioned by 25.0% of respondents was failure to get information on time, and 21% considered long distance from agricultural library as an impediment shortage of materials in the library, outdated library materials, libraries having little information on vegetable growing each was mentioned
as a problem by 7.1% of respondents. Majority (41%) had not been visited by agricultural extension
c officer, whereas 26.8% of the respondents mentioned that they had been visited only once per every
season of planting, and 25.0% of the respondents mentioned to have been visited 2-3 times every season
of planting, while only 7.1% of the respondents mentioned to had been visited more than 5 times when
season was due.

**Suggested ways to enhance horticultural farmers’ use of information in Morogoro urban**

This study also sought to get views of the respondents on ways of enhancing their access to and use of
information. The findings presented in Table 2, indicate that majority (57%) opined that AEOs should be
closer to farmers, followed by 42.9% of respondents who mentioned that public libraries should be
equipped with adequate materials on gardening, while 43% of respondents mentioned that the number of
AEOs should be increased, followed by 18% of respondents who mentioned that infrastructure (roads,
electricity, internet networks) should be extended to the rural areas, while 16.1% of respondents
mentioned that seminars to sensitize farmers should be organized more frequently.

In an interview with AEOs, they recommended that training to farmers on important farming methods
should be provided. They also called for establishment of more information centres in rural areas to
enhance farmers access to information. Public libraries should have up to date and relevant information
related to gardening. They also recommended that they should be provided with transport facilities to
enable them be able to disseminate information to peasants, and also that the AEOs should be provided
with training so as to update their skills.

**ANOVA Test**

Results on the ANOVA test run to test whether there were significant differences in the effect of the
treatment groups (Type of information, Access to Information, and Source of Information, Challenges to
information access, and Suggestions for improvement) on the performance or efficiency of the farmers
are summarized in Table 3.

The findings, $F_{0.05,3,26} = 8.6385$ as the tabulated value of $F$ at 5% level of significance, df1=degrees of
freedom for between groups=3 and Df 2= Degrees of freedom within groups=23 indicates that the value
is greater than the computed value of $F=1.385$ and hence we accept the null hypothesis. Thus there is no
significant difference in the effect of the treatment groups (Type of information, Access to Information,
Source of Information, Challenges to information access, and Suggestions for improvement) regarding
on the basis of demographic variables (age, gender and education. This result is further confirmed by the
Welch test of equality of means (sig=0.368> 0.05) which shows that there is no statistical significance
difference among the means of the groups thus they don’t differ significant in terms of information
needs, access, sources they depend on and the challenges they face to access horticultural crop farming
information.
Table 3: One-way ANOVA test

<table>
<thead>
<tr>
<th>Performance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1227.905</td>
<td>3</td>
<td>409.302</td>
<td>1.385</td>
<td>.270</td>
</tr>
<tr>
<td>Within Groups</td>
<td>7684.262</td>
<td>26</td>
<td>295.549</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8912.167</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Robust Tests of Equality of Means

<table>
<thead>
<tr>
<th>Performance</th>
<th>Statistic(^a)</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welch</td>
<td>1.184</td>
<td>3</td>
<td>9.278</td>
<td>.368</td>
</tr>
</tbody>
</table>

\(^a\) Asymptotically F distributed.

The Robust test for equality of means in the sample normal model presented in Table 4 indicates that there was no significant difference, among the means of the groups thus they don't differ significant in terms of information needs, access, sources they depend on and the challenges they face to access horticultural crop farming information. Furthermore, since there is equality of means of the groups then all the levels in any group in Table 2, should at least be above the individual group mean (see also Basu et al., 1993). Therefore, regardless of the presented demographic differences, efforts are equally needed to answer the farmers needs for Information on storage of harvests, Information on time of sowing and harvesting and Information on erosion control since they are below the average of 47. Additionally, it is important to improve access to information on storage of garden harvests, information on processing, and information on markets since they are below the average of 34. Cooperatives, SNAL, National/regional/district library, Internet services should be improved since they are below average of 33.7 and lastly the farmers should be visited in adequate times to improve the farmers’ performance, public libraries should be equipped with adequate materials, and number of extension officers should be increased since above the average of 17.8.

Discussion of findings

While horticultural farmers access to timely and appropriate farming information is a critical input for improving horticultural production (Ndimbwa et al, 2019; World Bank, 1994), provision of information basing on their needs is even critical. Identification of horticulture farmers’ information needs, respective sources and how to improve access to these sources improves provision of information to be desired. Moreover, the extent these needs are consistent over time is an instrument for a particular information users and developers.
The findings both descriptive and inferential statistics revealed that horticultural farmers in Morogoro needed information throughout the horticultural crops production life cycle from seed preparation to produce marketing. The needed information included information on drought, pests and diseases’ resistant horticultural varieties, time of sowing and harvesting, information on erosion control and information on disease and pest control. Others are information on management of quality and health of plants, storage of harvests and information on horticultural produces markets and prices. These needs do not differ much from the already documented needs in the literature (Singh, and Malhotra, 2011; Singh, and Malhotra, 2011; Bachhav, 2012; Ng’atigwa et al., 2020; Kaske, 2020). Basing, on robust tests of equality of means efforts are needed to answer the farmers needs for information on storage of harvests, information on time of sowing and harvesting and information on erosion control since they are below the average of 47. The study results are specifically in line with findings by Kaske (2020) on information needs and seeking behavior of farmers in Southern Ethiopia where information about diseases, pests and weather forecasts, crop production technologies and market information were identified as the top three most important types of agricultural information. This is also noted by Bachhav (2012). Provision of information basing on these needs is imperative if horticultural productivity is to be improved. Bennett et al. (2012) exemplifies that farm gate prices are low since farmers have limited information on available markets and therefore are in a weak position to negotiate prices.

Findings has indicated that friends and peers ranked high as important source of information farmers rely on, followed by Agricultural Extension Officers (AEOs), while other sources such as libraries, and mass media (radio and newspapers), ranked lowest as a sources of information by the small scale horticultural farmers. The results of this study are more or less similar to other studies such as Kaske (2020) and Bachhav (2012). Unlike this study, Kaske (2020) indicates that farmers used development agents as the first source of agricultural information, followed by local leaders, while neighbors, family, or friends were indicated as third dependable sources of agricultural information. Like this study, TV and radio ranked fourth and fifth (Kaske, 2020 and Bachhav, 2012). This study’s findings are in line with what Lwoga et al. (2010) in Tanzania and Bachhav (2012) in Maharashtra, India who observed that, especially in the remote areas of developing countries, most information seekers mainly pursue to obtain knowledge and information from informal rather than formal sources. According to Lwoga et al. (2010), farmers rely on the informal networks and, to a lesser extent, the mass media to meet their information needs. The findings are also in line with Madzingira (2001) who argues that interpersonal communication is a part of the traditional structure of most African communities that save as communication networks for the kinds of contents that usually flow in a neighborhood. Impliedly, as per (Masele, 2019) the more the colleagues/peers/family members have access to proper information on a phenomenon, including that related to horticultural crop farming the better. Information exchange among these farmers will affect subject norms and perceived behavioral control (Nguyen, et al. 2021).

According to Salau et al. (2013), awareness of the available information sources and how to access them improves access to information to be desired. Yet, a need to raise awareness of farmers about other sources is also revealed in the study. This is also theorized by Kisusi & Masele (2018) that a combination of strategies in any information and communication strategy is important. Combination of Television
broadcasts, radio broadcasts, exhibitions, composed stories, songs, dance, poems, libraries and others methods used can offer positive results for a desired change (see also Masele, 2019). Yet, despite libraries ranking low, they should not be forgotten in the mix as they are considered essential components of any strategy (UNESCO, 2001). Adoption of embedded librarianship model which moves librarians beyond the bounds of the library and into user spaces, classrooms, and within online environments is encouraged. According to Luca (2019) embedded librarianship will allow librarians to focus on the needs of one or more specific groups (including small scale horticultural farmers in this case), building relationships with those user groups, developing an understanding of their work, and providing information services that are highly customized and targeted to their greatest needs thus enhancing a user centric approach of library service delivery.

The findings further revealed that, while farmers are expected to use modern channels such as mobile phones, the Internet and social media to access horticultural information, challenges are related to underdeveloped infrastructure, cost and skills of use. Studies (Salau et al., 2013; Natsa, 2013; Ndimbwa et al., 2019 Abebe et al., 2019; Ng’atigwa et al., 2020) considers use of modern channels such as mobile phones or the Internet to access agricultural information as an important mile stone for enhancing agricultural information access by farmers. Unless farmers have information in their fingertips, they will also lose out on market opportunities for their produce. While there were already eight Mobile Service Providers in Tanzania by December 2020 including; Airtel, Tigo, Vodacom Tanzania, Zantel, Smart, Smile, TTCL, and Halotel (TCRA, 2020), serving more than 51 million by the end of 2020 (Tanzaniainvest, 2021), that would offer a good avenue for use of mobile phone for horticultural information to farmers, a good number is still not inaccessible to ICT services. It is therefore imperative that the observed informational related challenges are addressed accordingly to improve intended horticultural crop productivity.

Limitations and areas for further study

This study has focused only on information needs by small scale horticultural crop farmers in Morogoro Urban. There is a need to conduct a similar study in other parts of the country so as to get a wide perspective relating to a phenomenon. But also there is a need to conduct study in rural area where people live in relative isolation as compared to urban areas.

Conclusions And Study Implications

This study has examined information needs, sources, barriers, and strategies to enhance horticultural farmers’ use of information in Tanzania. The findings have shown that small scale horticultural farmers rely on friends/colleagues as their most important source of information. Other sources, such as libraries, AEOs, and mass media (radio and newspapers) scored low in the respondents’ list of used information sources. This implies that the more the colleagues/peers/family members have access to proper information on a phenomenon, including that related to horticultural crop farming the better. Information exchange among these farmers will affect subject norms and perceived behavioral control. While the
AEOs were expected to playing a front role as providers of information to small scale horticultural farmers, the study results have however shown a number of factors hinder farmers access to AEOs, including inadequacy in their number, underdeveloped infrastructures and reach the farmers, being unequipped with working gears such as bicycle/motorcycles to enable for a frequent visit to the farmers, and lack of up-to-date skills and training on relevant horticultural production related problems. Others like being distant from the library, or having libraries with outdated/irrelevant library materials.

Guided by the Sense making Theory and the Uses and Gratification Theory, this study has a number of practical, policy, and theoretical implications. Since the main source of information is interpersonal networks, it is important that colleagues/peers/family members and the general public have access to proper information on horticultural farming. Unless the colleague farmers have right information the shared information through interpersonal networks can a source of misinformation, and risky for horticultural farming productivity. Education provision through training, seminars, workshops and symposium to sensitize farmers with more up to date knowledge and skills should be organized more frequently to shape the farmers thinking, knowledge and attitude. The training will also improve on farmers’ awareness on the available information such as mass media; public libraries and exhibitions including user skills for optimal utilization of these resources.

The use of modern channels such as mobile phones, the Internet and social media supported by Web 2.0 to access horticultural information is strongly advocated. Horticultural development policy and decision makers in the country thus need to work on challenges related to underdeveloped infrastructure, cost and skills of use. This will not only increase farmers access to information by improving exchange among themselves but also increase contact to AEOs through mobile phones or social media such as WhatsApp's in addition to face-to-face contacts for various horticulture production matters. The study further recommends on the needs for adoption of embedded librarianship model that will make librarians close to farmers throughout, providing relevant and highly customized information to small scale horticultural farmers’ needs.

Mass media should increase coverage on better farming methods. It is important that media firms have skilled professionals who can appropriately convey horticultural farming information to needy farmers. Importantly is the responsible ministry and agricultural extensions officers to make use of the available media channels to convey important horticultural information on time to time basis. Yet, as media practitioners can no longer operate alone, adoption of a convergence culture that would offer users ability to access horticultural news from range of media platforms, is important.

Declarations

Funding:
No funding is related to this paper

Competing interest statement:
The author has no any competing interest
References


30. Masele, J.J. (2019). Access to and use of computer ergonomics related information among PhD students in East Africa: a case of University of Dares Salaam -Tanzania and Makerere University-
Uganda, University of Dar es Salaam Library Journal, 14 (1), 4-22.


45. Solano et al. (2003) asserts that, the importance of different informational sources slightly changes throughout the decision-making steps, the family and farm staff being the most preferred information sources.


**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- Appendices.docx
- appendix.doc