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# CYBER EXTENSION SERVICES IN FULFILLING INFORMATION NEEDS OF A FARMER COMMUNITY: A CASE STUDY OF SIYAMBALANDUWA CYBER EXTENSION UNIT

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## ABSTRACT

**Cyber extension services are extended by the Department of Agriculture (DOA) since 2004 to fulfil the information needs of farmer communities in an affordable manner. This study was carried out to i) examine the usage level of cyber extension services by the farmers, ii) examine the factors affecting the use of Cyber Extension Unit (CEU), and iii) identify the problems and limitations associated with cyber extension services. A questionnaire survey (n=91) was conducted among the farmers belong to Siyambalanduwa CEU, in the Moneragala district. Siyambalanduwa CEU was purposively selected for the study. Stratified random sampling was practiced to select respondents for the survey.**

**According to the results, majority (66%) of respondents were between 36-65 years. About 40% had studied up to GCE O/L, while the rest have studied up to grade 9 (22%), and GCE A/L (19%). Use of computer based services such as the websites, and emails were not common among the respondents due to poor ICT skills and lack of confidence. Availability of mobile phones were quite high (85%) among the farmers. Majority were interested in receiving information related to correct weather forecast & early warning information (76%), market information related to prices, sources of quality seeds & fertilizers (75%), current market trends and places to get competitive best price for harvest (75%), regional farming practices (72%) and crop protection technologies (71%). However more than 80% of the respondents were unsatisfied on the services provided by the CEU in fulfilling the above information needs. The study concluded that it is vital to consider perceived information needs of the farmer community as a starting point when strengthening the present cyber extension system.**

**Keywords:** Cyber extension, Agricultural information, Siyambalanduwa Cyber Extension Unit

## INTRODUCTION

Information, given at the right time is crucial for modern agriculture. The advancements in computer technology and improvements in telecommunication sector opened new gateways to deliver agricultural information to interested stakeholders. Governments were quick to find ways and means to use new technologies to disseminate technical and economic information to the end users so that they can use it in decision making process.

Cyber extension has been initiated in Sri Lanka in year 2004 as an appropriate and affordable information delivery mechanism to satisfy information needs of rural farmers (Wijekoon et al., 2008). In the beginning, about 45 Cyber Extension Units were established at 45 Agrarian Service Centres during the period of 2004-2006. These units were provided with computer facilities and a series of interactive multimedia cds, hoping the farmers and extension officers will make use of these resources. Since then the Department of Agriculture (DOA) had invested heavily in improving cyber extension services for the benefit of rural farmers. Staff training programs were conducted to improve ICT skills of the extension staff while the performance of ceus was monitored regularly.

However, little attention was given to study the farmers' perception towards CEU services and the level of acceptance of ceus as rural knowledge centres in the recent years. It is necessary to study the level of satisfaction of services provided by the ceus mainly because such evaluations will be instrumental in developing user-driven models for cyber extension. Hence, the objectives of this study were to: i) examine the usage of ceus by the farmers to satisfy their information needs, ii) to study the farmers' level of satisfaction on the services provided by the CEU, and iii) to identify the factors affecting the usage of ceus.

## MATERIALS AND METHODS

The technology acceptance model proposed by Davis *et al.* (1989) was used in designing the study model (Figure 1).

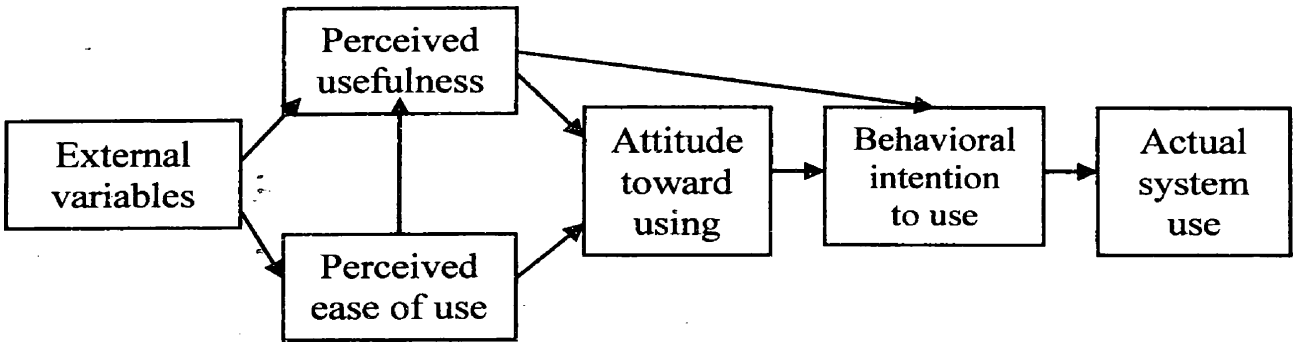



**Figure 1. Technology Acceptance Model (Davis *et al.*, 1989)**

District of Monaragala, in which 85% of the population is rural and 80% of the rural is engaged in agriculture, was considered as representative of the island's agricultural sector. Siyambalanduwa CEU was selected to conduct the study considering the continuous and uninterrupted operations of the unit compared to the other units in the area. Stratified random sampling was used to select 91 respondents for the questionnaire survey. The stratification was based on cultivation area. Respondents were selected from all 13 cultivation areas. The data collection instrument was pre-tested with 10 farmers. The questionnaire had total of 26 questions, including both closed and open ended questions. The questionnaire was created based on the Technology Acceptance Model (TAM). A separate questionnaire was given to the Extension officers (n=5) to study their perception on CEU usage among farmers, and facilities available in the CEU.

Data were analysed using descriptive statistical methods such as frequency analysis and correlations. A Spearman's rank-order correlation was used to determine the relationship between respondents' behavioural intention

and actual use of CEU services. Both perceived usefulness and ease of use were measured using a five point Likert scale. Statistical Package for Social Sciences was used in data analysis.

## RESULTS AND DISCUSSIONS

### Usage of CEUs

Usage of the CEU was determined based on the frequency of visits to the CEU and the usage of information services and resources available in the CEU.

### Frequency of visiting the CEU

The distribution of respondents based on the frequency of visiting the CEU is presented in Figure 2. Only a few (10%) respondents had made frequent visits to the CEU, indicating they have visited at least twice a month and attended all the training programmes conducted by the CEU. About 15% respondents had visited the CEU at least once a month and have attended all the training programmes. These respondents were categorized as visiting the CEU "often". The Majority (41%) had visited occasionally, indicating that they have visited at least once in two months, and had attended most of the training programmes. About 22% had made at least one visit to the CEU in a given season, and had attended most of the training programmes. Few respondents (12%) had visited only once.

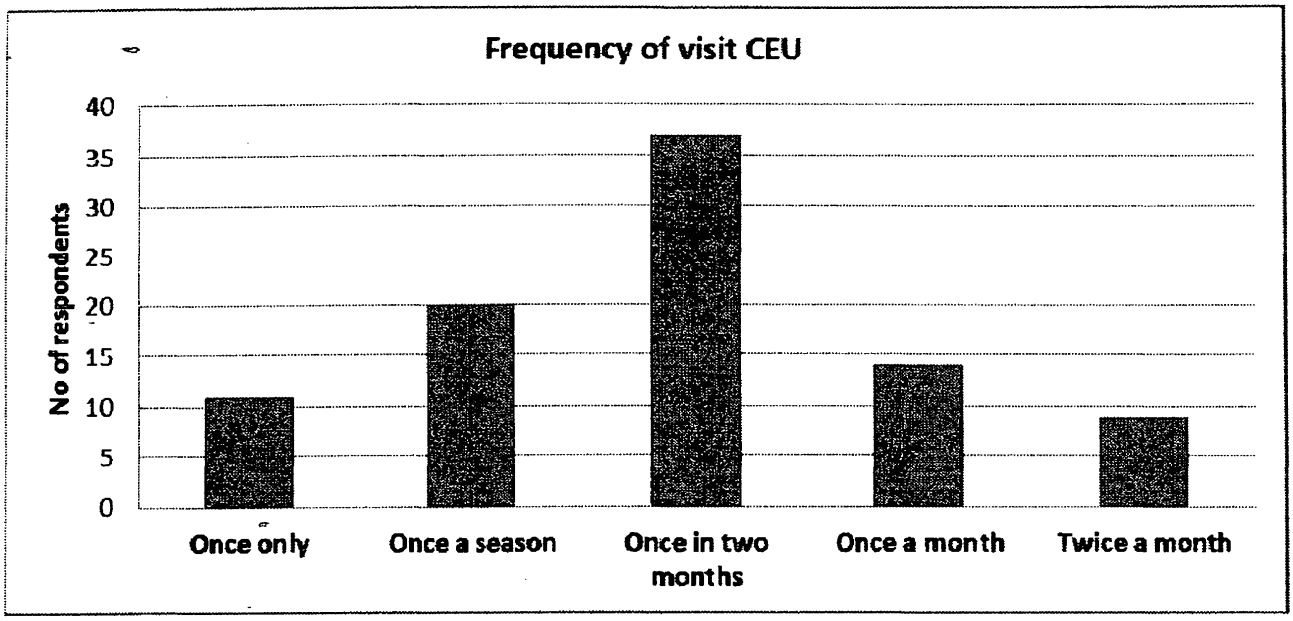



**Figure 2. Distribution of respondents based on the frequency of visiting the Cyber Extension Unit (CEU)**

## Use of information resources available in the CEU

CEUs were provided with a series of information resources including both printed and electronic material. Usage of these information resources was determined based on the frequency of using such resources by a given respondent (Table 1).

**Table 1. Frequency of use of Information Resources**

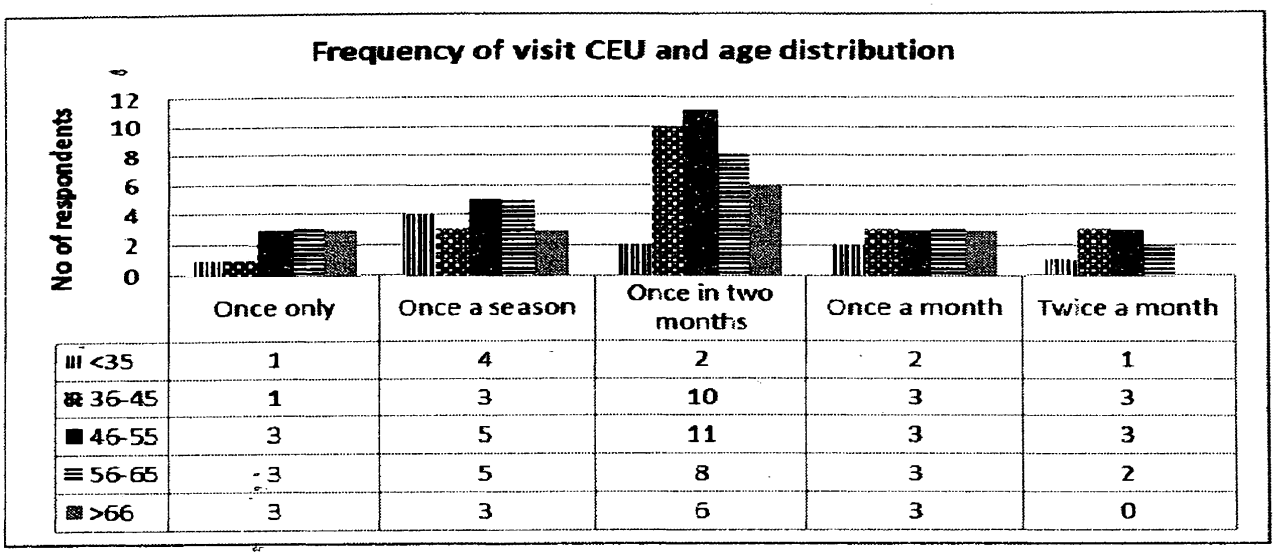
| Information Resource | Almost all the items available | | Most of the items available | | Half of the items available | | A Few items available | | Not any | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Printed Material | 9 | 10% | 29 | 32% | 25 | 27% | 2 | 2% | 26 | 29% |
| Interactive Multimedia CDs | 4 | 4% | 19 | 21% | 34 | 37% | 5 | 5% | 29 | 32% |
| Internet, emails, and Skype facility | 0 | 0% | 0 | 0% | 0 | 0% | 41 | 45 % | 47 | 52% |
| CEU monthly Programs | 0 | 0% | 45 | 49% | 32 | 35% | 14 | 15 % | 0 | 0% |

Accordingly, many farmers (49%) visited the CEU to participate in CEU monthly programs, in which ICT based resources, were used as support material. Interactive CDs available in the CEU had been regularly accessed by only a few (4%) farmers. Similarly, printed materials available in the CEU had been used by only a few (10%) farmers. As observed, contents given in the CDs and printed materials have not been updated in recent years. Respondents mentioned that the information available in the CDs are obsolete and does not match with their real information needs, which lead to poor usage of such material. Majority of the respondents (62%) mentioned that their purpose of visit to the CEU was mainly to meet the extension officer.

It was observed that a considerable number of farmers have regularly attended the training programs conducted in the CEU. When conducting these training programs, the extension officers used the equipment available in the CEU such as computer, multimedia projector, and IMM CDs. Thus, it is evident that a large number of farmers have been indirectly benefited by the CEU services.

There were about 74% males and 26% females among the respondents. The majority (25%) of the respondents were between 46 - 55 years, while the others belonged to 56-65 years (21%), 36-45 years (20%), above 60 years (15%), and below 35 years (10%) age categories.

The Figure 3 shows the distribution of respondents based on their age and frequency of visit to the CEU.

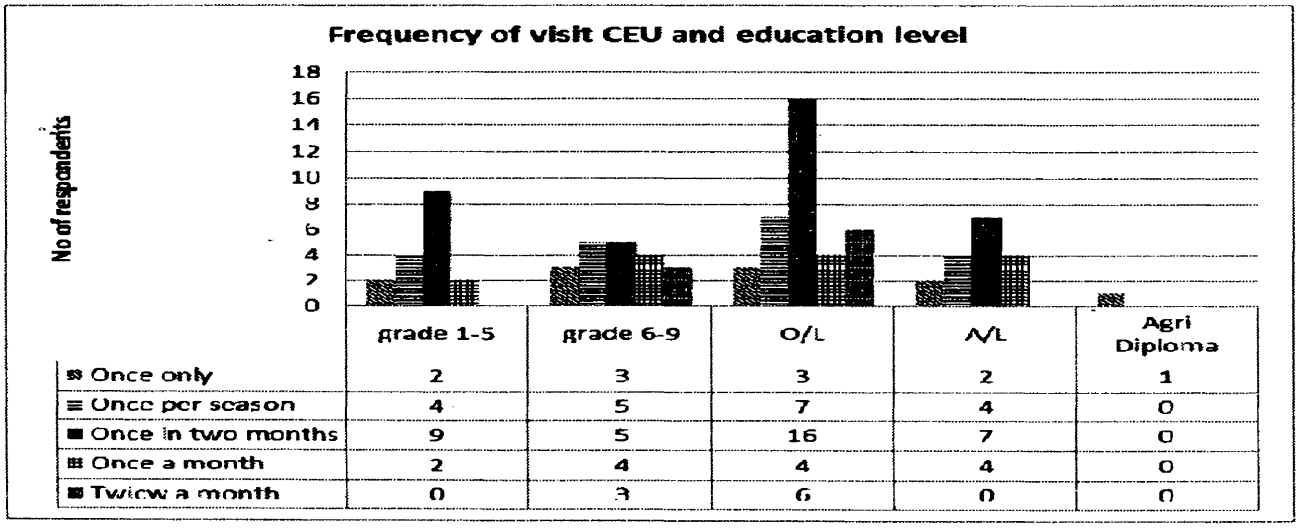



| | Once only | Once a season | Once in two months | Once a month | Twice a month |
|---|---|---|---|---|---|
| <35 | 1 | 4 | 2 | 2 | 1 |
| 36-45 | 1 | 3 | 10 | 3 | 3 |
| 46-55 | 3 | 5 | 11 | 3 | 3 |
| 56-65 | 3 | 5 | 8 | 3 | 2 |
| >66 | 3 | 3 | 6 | 3 | 0 |

**Figure 3. Distribution of farmers based on their age category and frequency of visits to the CEU.**

As shown in the Figure 3, the respondents between 36-55 years were the most frequent visitors to the CEU. Younger farmers, those who were less than 35 years, visited less frequently even though these farmers were often seen as more receptive for ICT based mechanism to receive agriculture related information when compared to older farmers.

Figure 4 shows the distribution of farmers based on their education level and the frequency of visiting the CEU.




| | grade 1-5 | grade 6-9 | O/L | A/L | Agri Diploma |
|---|---|---|---|---|---|
| Once only | 2 | 3 | 3 | 2 | 1 |
| Once per season | 4 | 5 | 7 | 4 | 0 |
| Once in two months | 9 | 5 | 16 | 7 | 0 |
| Once a month | 2 | 4 | 4 | 4 | 0 |
| Twice a month | 0 | 3 | 6 | 0 | 0 |

**Figure 4. Distribution of farmers based on their education level and the frequency of visiting the CEU.**

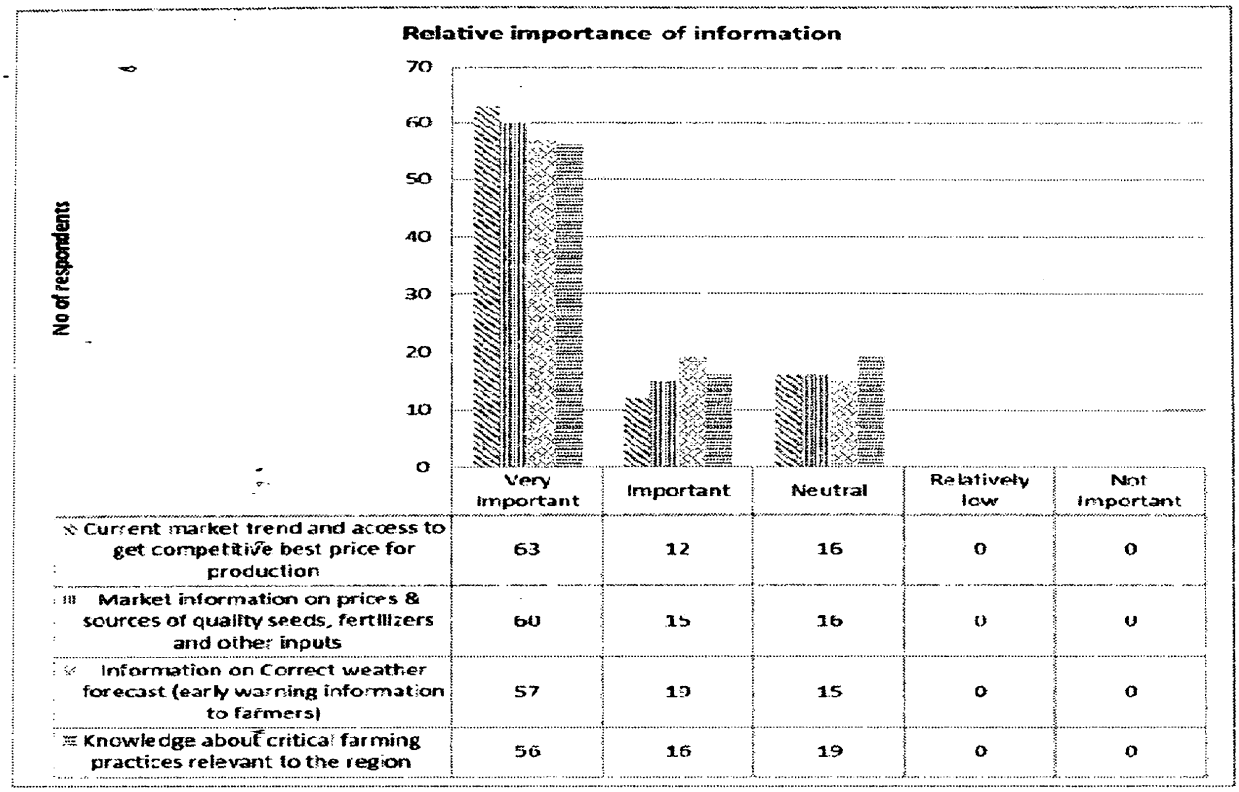
According to the findings, almost all (100%) the respondents were literate. Majority (39.6%) had completed education up to GCE Ordinary Levels. The others had studied up to the 9th grade (22%), A/Ls (18.7%), and grade 5 (18.7%). One respondent had completed a Diploma in Agriculture, which was the highest level of education attained by a respondent. It was observed that more educated farmers were not interested in visiting the CEU. Farmers who were educated up to O/L or less were the most frequent visitors to the CEU.

**Access to computers, internet and mobile phones**

Most of the respondents (85%) had mobile phones while only a few (5%) had access to computers. Familiarity and usage of the internet and email found to be very poor. About one third of the respondents (34%) believed that their computer knowledge is either weak or quite poor, while the majority (66%) mentioned that they do not have any computer skills. Since, mobile phones were the most commonly (85%) available ICT tool among the respondents, there is a high potential to use mobile phones to communicate agricultural information. It was reported that mobile phones provide new opportunities to support development by providing access to information and by building communication lines between people and communities around the world (Furuholt, 2009; Coyle, 2005). However, in most developing countries mobile phones potential is yet to be effectively leveraged (Sanga *et al.*, 2013; World Bank group, 2011).

**Perceived information needs**

The type of information farmers would most likely to receive through the CEU were studied. Figure 5 shows the types of information that were perceived as the most important by the respondents.




| | Very important | Important | Neutral | Relatively low | Not important |
|---|---|---|---|---|---|
| Current market trend and access to get competitive best price for production | 63 | 12 | 16 | 0 | 0 |
| Market information on prices & sources of quality seeds, fertilizers and other inputs | 60 | 15 | 16 | 0 | 0 |
| Information on Correct weather forecast (early warning information to farmers) | 57 | 19 | 15 | 0 | 0 |
| Knowledge about critical farming practices relevant to the region | 56 | 16 | 19 | 0 | 0 |

**Figure 5. Relative Importance of Information.**

According to Figure 5, majority (75%) of the respondents needed information related to current market trends and market prices. Furthermore, the respondents were interested in receiving information related to finding good quality inputs such as quality seeds and fertilizers (75%); weather forecasts and early warning information on unfavourable weather conditions (76%); productivity improvement and quality measures (72%), knowledge on critical farming practices relevant to the season, new technologies, crop protection techniques (71%).

## Perceived level of satisfaction

Figure 6 shows the distribution of respondents based on the level of satisfaction on the existing information services provided by the CEUs.

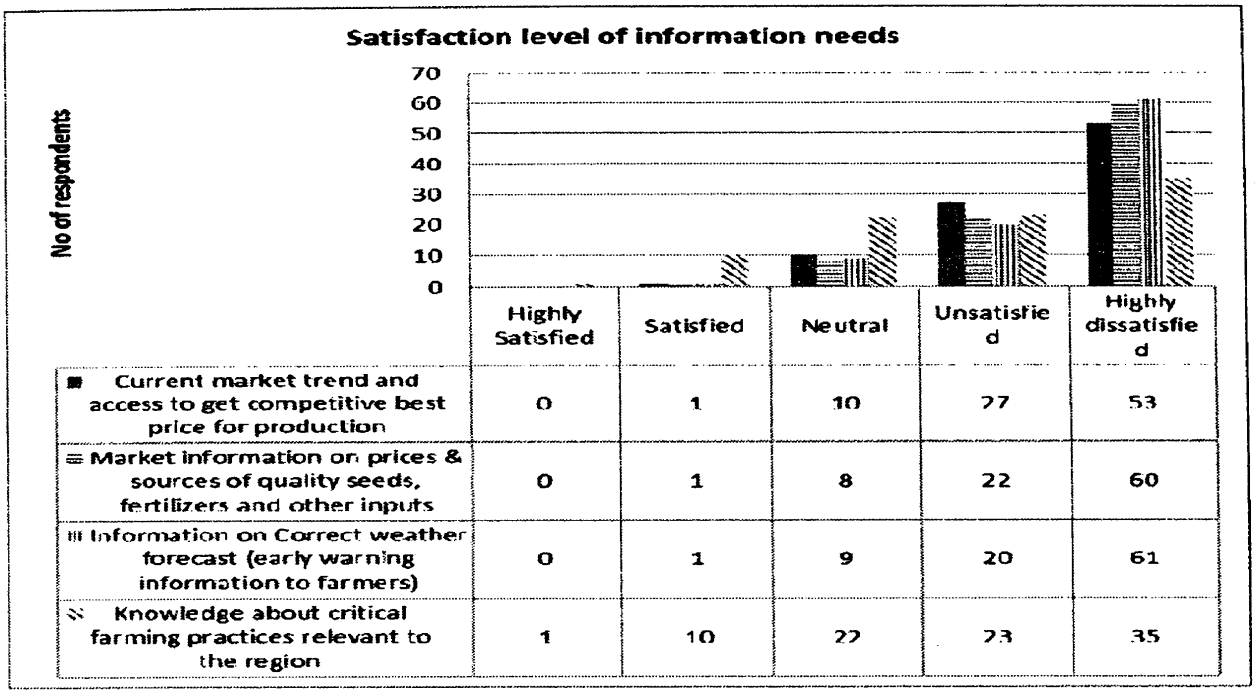



**Figure 6. Level of Satisfaction on existing CEU Services.**

Level of satisfaction on the above information was found to be considerably low. However, some of the respondents were satisfied with the information received on land preparation and planting, productivity improvement, quality measures, and pesticides and herbicides usage.

Figure 7 shows a comparison between the perceived information needs of the farmers and level of satisfaction towards CEU services in fulfilling these information needs. Accordingly, there is a considerable gap between the farmers' expectations from the CEU and the level of satisfaction.

This study only looked at the broader categories of information requirements that need attention. Further research is necessary to isolate specific needs of the farmers. It is also necessary to develop suitable mechanisms to fulfil such information needs.

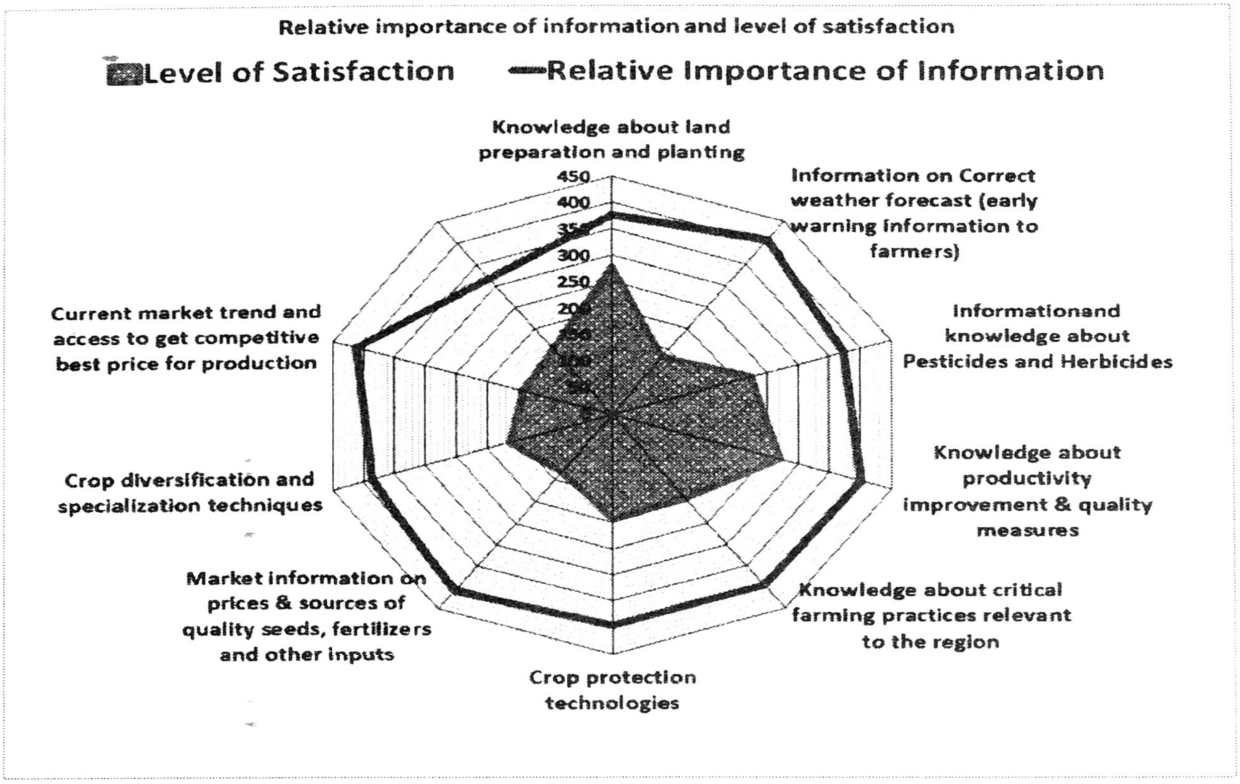



**Figure 7. Distribution of respondents on perceived importance of information and level of satisfaction on information services**

## Factors affecting the use of CEU

The factors affecting the use of CEUs were studied in terms of demography, characteristics of CEUs, perceived ease of use of CEU services, perceived information needs, perceived usefulness, preference for sources of information, behavioural intention to use CEUs, and attitudes towards using CEUs (Table 2).

The use of CEU services were positively related to the perceived usefulness of the CEU services ($r_s$ = 0.415, p = 0.000). Moreover, perceived usefulness had positive relationships with attitude ($r_s$ = 0.215, p = 0.041), and behavioural intention of using CEU ($r_s$ = 0.261, p = 0.012). The behavioural intention was positively related to perceived ease of use ($r_s$=0.320, p=0.002) and attitude ($r_s$=0.313, p=0.002).

**Table 2. Spearman's "ρ" correlation coefficients.**

| Variables | Correlation coefficients ('r' value) | p-value | alpha | States |
|---|---|---|---|---|
| Perceived usefulness and Attitude | 0.215 | 0.041 | 0.05 | Accepted |
| Perceived ease of use and Attitude | -0.089 | 0.402 | 0.05 | Rejected |
| Perceived usefulness and Behavioural intention to use CEU | 0.261 | 0.012 | 0.05 | Accepted |
| Perceived usefulness of CEU and Actual use of CEU | 0.415 | 0.000 | 0.01 | Accepted |
| Familiarity with ICTs and - Attitude | 0.106 | 0.319 | 0.01 | Rejected |
| Familiarity with ICTs and Perceived ease of use of CEU | -0.089 | 0.401 | 0.01 | Rejected |
| Preferences for sources of information-Attitude | 0.289 | 0.005 | 0.01 | Accepted |
| CEU characteristics - Attitude | 0.289 | 0.005 | 0.05 | Accepted |
| Perceived Ease of use - Perceived usefulness | 0.107 | 0.312 | 0.05 | Rejected |
| Behavioural intention - Actual use | 0.191 | 0.069 | 0.05 | Rejected |

## Problems Associated with Using the CEU

Perceived problems related to the use of CEU were studied with both the farmers and the officers attached to the CEUs. Farmers believed that lack of computer knowledge and skills as the main barrier which prevents them from using the CEU and related electronic resources effectively. However some of them commented that they can get the assistance of those others, who possess necessary skills, to go through the electronic resources if the information given is up-to-date and relevant. Thus, the main problem being the unavailability of such resources. A few farmers mentioned that they were not adequately aware on the information resources available in the CEU.

Most of the extension officers attached to the CEU were newly recruited and were not given adequate training to use CEU resources. Poor technical infrastructure, lack of support in maintaining the CEU resources especially the equipment and poor internet facilities were seen as the other main drawbacks. It is interesting to note that some of the problems that were noted in previous studies such as poor telecommunication infrastructure in rural areas, lack of awareness among farmers on CEU services, lack of ICT literacy among farmers, poor maintenance of CEUs, and poor technical skills to use new ICT tools (Wijekoon, 2009; Dissanayeke, 2010; Dissanayeke *et al.*, 2009) were still persisting in the study area.

## CONCLUSIONS

Based on the findings of this study, the following conclusions can be made. The level of use of CEU services among farmer community is satisfactory in terms of attending training programs conducted through the CEUs. Computers and electronic resources have been adequately used by the extension staff in preparing training material, thus, both extension officers and farmers are benefited. However the usage of e-resources available in the CEU by an individual farmer was relatively low and inadequate, mainly due to poor ICT skills among farmers.

Farmers were mostly interested in learning current market trends, prices, weather information and agricultural inputs. Thus, it is essential to communicate these information through CEUs, in order to make the services more acceptable and useful for the target community. The information given through the e-resources need to be more up-to-date and relevant. This study however suggests only the broad categories of information needs, thus, future

research is necessary to identify specific information needs of the farmer community.

Training opportunities can be arranged on a regular basis for the extension staff. Farmers need to be aware on the different services provided through CEUs. These CEUs can play a vital role in introducing the recent ICT initiatives launched by the DOA to the farmer community.

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