Original Research Article

Effect of Information Sources and their characteristics on Knowledge and Adoption of Cultural Practices of the Domestic Floriculture Growers in the Central Province of Sri Lanka

Abstract

Floriculture industry has become a high-income generating agribusiness today in Sri Lanka. It also brings a considerable amount of foreign exchange to the country annually, which is an important factor for the country's economy. The climatic variation of the Central Province of Sri Lanka provides a suitable growing environment for different tropical and subtropical floriculture species. There are more than 700 floriculture nurseries in the province. They grow an array of popular floriculture varieties for the local market. The objectives of the research were to identify the information sources, their characteristics, and their effect on technical knowledge and adoption of grower's cultural practices. Among the growers, 210 were randomly selected. A three-point scale was used to measure the levels of technical knowledge. Required primary data were collected through personal interviews with a pretested questionnaire. Data were analyzed using Statistical Package for Social Sciences (SPSS).

Anthuriums, Orchids, Roses, Foliage , and Mixed flowers were the main floricultural crops grown by the growers in the province. Different percentages of respondents grow different types of floricultural crops (53.8% to 63.3%). The numbers of respondents show that one grower may grow more than one type of crop. A higher numbers of the growers grow anthuriums (68.5%), mixed flowers (63.3), and foliage (59.0)). The reason could be the higher demand for those flowers. These floricultural crops have high demands in the local market as well as in the foreign market. Television was partly helpful for the growers (78.8%) as an information source.

The highest mean values of overall quality of information were for the information given by the botanic garden extension staff (16.45) and fellow growers (14.37). The majority of the respondents have received adequate (82%), fully trustworthy (84.1%), fully timely (73.4%), fully useful (81.7%) technical information from the Botanic Gardens extension staff. The fellow growers (43.1%) were also an important information source for the growers. Private companies (1.1%) and radio (1.1%) provided the least amount of information. The relationship between the overall technical knowledge and the overall information sources was significant (p value is 0.007). The relationship between the overall adoption and the overall information sources was also significant (p value is 0.007). Depending on the situation, different information sources provide the growers with trustworthy, useful and timely information. Growers receive quality information from the extension officers of the Department of National Botanic Gardens (DNBG) and the fellow growers. Therefore, it is recommended to provide necessary quality information to the growers through the DNBG.

Keywords: Floriculture industry, knowledge, adoption, Central Province, Sri Lanka.

1. Introduction

Floriculture Industry

Worldwide more than 145 countries are involved in the floriculture industry and the global floriculture trade is estimated to be at US$ 49 billion in 2020, and is projected to reach US$ 70 billion in 2026 (Facts and Factors, 2021). According to The International Association of Horticultural Producers, an area of 702,383 ha was under flower production in different countries of the world. The Netherland is the major center of production and distribution of floricultural produce in the world, and it is about 52% of the global trade (IAHP/AIPH, 2010)

Today floriculture industry has become an income generating agribusiness in Sri Lanka. Limited literature and data are barriers in developing the industry (Kodagoda, and Padmini,

2017). Although floriculture started as an industry in the 1970s, it has a long history in Sri Lanka. It started as a hobby and later became a profitable industry. The Cut Flower Industry was formulated, and an export market was formulated in 1977 (Ekanayake and Hagen, 1977). The annual income in the floriculture industry in Sri Lanka was estimated at Rs.572.9 million in 1999 (EDB, 1999). In 2021 it was US$ Million 16.19 and in 2022 (March) it was US$ Million 3.99 (EDB, 2022). It is important to take immediate steps to alleviate constraints faced by the growers to develop the industry. The Department of National Botanic Gardens (DNBG) was established, in 2006 and the development of the floriculture industry in Sri Lanka became a mandatory function of the department (The Gazette of the Democratic Socialist Republic of Sri Lanka, 2006).

The Knowledge and Adoption of recommended technical methods in floriculture would be vary in different floriculture growers. According to a research done in Srinagar and Budgam districts in India with the *Gladiolus* flower growers, it was found that only 14.55% of the growers had complete knowledge of nitrogen application (Wani, and et al., 2017). The drivers and barriers towards the adoption intension by the growers are also impotent in adoption process (Daems, Moons, Pelsmacker, Pijnenburg, and de Velde, 2022). Developing technologies in developing countries must be adopted to suit local agricultural and cultural contexts (Science Direct, 2021, https://doi.org.10.1016/j.worlddev.2021.105599). According to a research done in Tamil Nadu, India it was found that different flower growers such as Chrysanthemum, Tuberose, Rose, have different technical gap in adoption practices from75 % to 100%. It was found that the reasons were lack of awareness of recommended varieties, lack of skilled labours, high cost in adopting practices (Beaulah, and et al., 2020).

Objectives of this study

The objective of this research was to identify the information sources used by the growers, their characteristics, and their effect on technical knowledge and adoption of grower's cultural practices. It was also to identify the varieties of floricultural crops grown by the growers in the province.

2. Methodology

Collection of Data and Data Analysis

A pretested questionnaire was administered from May to December 2019 to collect data through personal interviews. The data were analyzed using descriptive and analytical statistical techniques. The level of significance used in the analysis was 0.05.

3. Results and Discussion

3.1 Types of Flowers Grown by the Growers

Table 1: Types of floricultural crops grown by the respondents

Type of crop	Number of respondents	Percentage (%)
Anthuriums	133	63.3
Orchids	118	56.2
Roses	113	53.8
Foliage	124	59.0
Mixed flowers	144	68.5
N (Number of growers)	**210**	

Table 1 shows that different percentages of respondents grow different types of floricultural crops (53.8% to 63.3%). The numbers of respondents show that one grower may grow more than one type of crop. A higher number of the growers grows anthuriums and mix

flowers. The reason could be the higher demand for those flowers. These two types of flowers and foliage plants have a high demand in the local market as well as in the foreign market. This could be a reason why more respondents grow these flowers.

3.2 Extent of Information Received from Different Sources.

Table 2: Extent of information received according to the information sources

Information Source	Not received (%)	Partly received (%)	Adequately received (%)
1.Newspapers	35.0	61.0	4.0
2.Radio	59.0	39.i	1.1
3.Television	18.8	78.8	2.4
4.Fellow growers	8.9	48.0	43.1
5.Agric. Instructor	56.0	32.4	11.6
6.Pvt. companies	88.7	10.2	1.1
7.Botanical gardens	7.5	10.5	82.0
8.Exhibitions	14.7	62.1	23.2
9. Publications	13.9	79.2	6.9
10.Internet	24.3	57.7	18.0
11.Other sources	50.0	50.0	0.0
Total	**31.8**	**47.5**	**20.7**

The growers received information from different sources. According to Table 2, the majority of the respondents have received adequate technical information from the Botanic Gardens extension staff (82%). After the establishment of the Floriculture Research Development Division of the Department, the staff of the three botanical gardens do the floriculture extension activities. The new floriculture associations were established by the Botanic Gardens. Therefore, the growers could communicate with the garden extension officers frequently. Television was partly helpful for the growers (78.8%) as an information source. The fellow growers were also an important source (43.1%) for the growers. The fellow growers also

have close contact with one another in many activities. Therefore, they always exchange their technical knowledge and experience.

3.3 Trustworthiness of Information on Floriculture from Different Sources

Table 3: Trustworthiness of information received from different sources

Information sources	Not Trustworthy (%)	Partly Trustworthy (%)	Fully Trustworthy (%)
1.Newspapers	27.5	69.2	5.3
2.Radio	48.2	49.4	2.4
3.Television	14.7	75.6	9.6
4.Fellow growers	6.0	45.4	48.5
5.Agric. Instructor	52.2	30.5	17.2
6.Pvt. companies	59.6	25.8	14.5
7.Botanic gardens	5.6	10.2	84.1
8.Exhibitions	13.5	70.8	15.6
9.Publications	33.8	55.0	11.1
10.Internet	13.6	71.0	15.3
11.Others	37.5	62.5	0.0
Total	**28.3**	**51.4**	**18.9**

According to Table 3, the information received from most of the sources was trustworthy. The growers fully trusted (84.1%) the information received from the Botanic Garden extension officers. They also received fully trustworthy (48.5%) information to a certain extent from the fellow growers. Information received from other sources was only partly trustworthy (62.5%).

These figures show that the growers receive required information from many sources with different levels of trustworthiness.

3.4 Timeliness of Information on Floriculture

Table 4: Timeliness of information received from different sources

Information source	Not timely (%)	Somewhat timely (%)	Fully Timely (%)
1.News paper	35.2	59.0	5.8
2.Radio	54.7	43.4	1.7
3.Television	21.0	73.3	5.6
4.Fellow growers	5.6	38.2	56.1
5.Agric. Instructor	57.7	33.8	8.3
6.Pvt. companies	83.4	14.0	2.5
7.Botanic gardens	12.7	13.7	73.4
8.Exhibitions	14.1	71.2	14.7
9.Publications	33.3	52.7	13.8
10.Internet	15.5	66.4	17.9
11.Others	50.0	50.0	0.0
Total	**38.8**	**46.8**	**14.4**

According to Table 4, information from most of the sources was received partly timely or fully timely. However, information from the private companies was not received in time. However, they received required information always (73.4%) in time from the Botanic Garden staff. This is an indication of a proper communication with the Botanic Garden staff and the growers. They also received somewhat timely information from other sources also (50%).

3.5 Usefulness of Information on Floriculture

Table 5: Usefulness of information received from different sources

Information sources	Not useful (%)	Partly useful (%)	Fully useful (%)

1.Newspapers	32.0	58.5	9.5
2.Radio	32.1	44.8	3.0
3.Television	18.8	69.8	11.2
4.Fellow grower	9.2	43.5	47.2
5.Agric. Instructor	72.3	29.2	17.1
6.Pvt. companies	81.8	10.5	5.5
7.Botanic Garden	7.8	10.4	81.7
8.Exhibitions	15.3	60.0	24.5
9.Publications	37.0	51.1	11.9
10.Internet	18.0	60.4	21.5
11.Others	50.0	50.0	0.0
Total	**34.0**	**44.3**	**21.1**

According to Table 5, Information received from the Botanic Garden staff (81.7%) was almost fully useful. Information received from fellow growers was also partly or fully useful. The private companies were unable to provide useful information to the growers. This could be due to lack of proper communication with the floriculture growers and the companies. Therefore, it is the responsibility of the DNBG to provide the growers with required information.

3.6 Overall Quality of Information Sources Used by the respondents

An index was prepared for the overall quality of the information sources by using the characteristics of information such as usefulness, trustworthiness, timeliness, availability (extent), understandability, and relevance. The respondents' values 1, 2, and 3 given for each characteristic were added and mean values were calculated.

How about the separate tables for availability, understandability and relevance ---

Table 6: Mean comparison of overall quality of different sources of information

Information sources	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
1.Pvt. companies	157	2.00	18.00	6.96	2.38678
2.Radio	162	1.00	15.00	7.63	2.67003

3.Agric. Instructor	179	4.00	18.00	9.58	4.12973
4.Publications	175	2.00	18.00	10.31	3.56978
5.Newspapers	187	4.00	18.00	10.62	3.19277
6. Television	191	2.00	18.00	11.51	2.67121
7.Internet	167	1.00	18.00	12.16	3.42559
8.Exhibitions	181	5.00	18.00	12.45	3.20663
9.Fellow growers	191	4.00	18.00	14.37	3.49029
10.Botanic Gardens	192	2.00	18.00	16.45	3.27731

Table 6 shows the highest mean values were for the Botanic Garden extension staff and fellow growers as information sources. The private companies had the lowest mean value, and it shows that the growers do not get much quality information from the companies.

3.7 Strength of relationships between some variables

3.7.1 Overall adoption versus overall information source (Model 1)

Table 7: Regression model summary of overall adoption versus overall information source

Model Summary

R	R square	Adjusted R square	Std. error of the estimate
.494[a]	.244	.179	2.1592

The adjusted R squared value is .179. This means that only 17. 9% of the variation of the overall adoption is explained by the overall information sources. This is not a strong relationship. Therefore, the future extension activities have to be designed to provide the growers with quality technical information through the sources. This would strengthen the relationship between the information sources and the adoption.

Table 8: Variance of overall adoption and of overall information source

ANOVA[a]

	Sum of square	df	Mean square	F	Sig.
Regression	191.607	11	17.419	3.736	< .001[b]
Residual	592.076	127	4.662		
Total	**783.683**	**138**			

According to Table 8, the regression relationship between the overall adoption and the overall information sources is significant. Here the p value is 0.001. Therefore, the model is significant at 5% significance level. However, as shown in Table 7, it is not a strong relationship.

Table 9: Coefficient values of overall adoption and of overall information sources

Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients Beta		
	B	**Std. Error**		**t**	**Sig.**
(Constant)	12.061	2.743		4.397	<.001
1. Newspaper	-.021	.070	-.029	-.305	.761
2. Radio	-.080	.063	-.116	-1.276	.204
3. TV	-.065	.081	-.074	-.806	.422
4. Fellow grower	-.191	.064	-.295	-2.979	.003
5. Agriculture Instructor	.059	.059	.092	.989	.324
6. Private companies	-.016	.081	-.017	-.203	.839
7.Botanig Garden Officer	-.043	.083	-.063	-.525	.600
8.Exhibitions	.064	.084	.088	.767	.445
9.Publications	.119	.064	.168	1.868	.064
10.Internet	.174	.059	.289	2.960	.004
Knowledge overall	**.272**	**.152**	**.150**	**1.794**	**.075**

a. Dependent Variable: overall adoption

Table 9 represents the coefficient values of each dependent variable. According to coefficient values, we can check the strength and the direction of the relationship between the

dependent variable with each independent variable. Newspaper as an information source has a coefficient value of - 0.021. This value represents that the overall adoption has a negative relationship with the Newspaper as an information source. One unit change of Newspaper as an information source will decrease the overall adoption by 0.021 units. On the other hand, this negative relationship is a weak relationship. Anyway, this is not a significant relationship because the p value is 0.761, which is more than 0.05. Likewise Radio, TV, Agriculture Instructor, Private companies, Botanic garden Officers, as information sources show weak negative relationships but not significant ($p < 0.05$). Only Fellow Growers and Internet show significant relationships -0.191 and 0.174 respectively. However, these relationships are also weak.

3.7.2 Overall Tech knowledge versus overall Information source (Model 2)

Table 10: Regression model summary of overall technical knowledge verse overall information source.

Model Summary

R	R square	Adjusted R square	Std. error of the estimate
.405[a]	.164	.100	1.2545

The adjusted R squared value is .100. This means that only 10% of the variation of the overall technical knowledge is explained by the overall information sources. This is not a strong relationship.

Table 11: Variance of overall technical knowledge versus overall information source

ANOVA[a]

	Sum of square	df	Mean square	F	Sig.
Regression	40.505	10	4.051	2.574	.007[b]
Residual	206.150	131	1.574		
Total	**246.655**	**141**			

According to Table 11, the regression relationship between the overall technical knowledge and the overall information sources is significant. Here the p value is 0.007. Therefore, the model is significant at 5% significance level.

Table 12: Coefficient values of overall adoption and of overall information source

Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	16.095	.712		22.603	<.001
1.Nwespaper	-.077	.040	-.190	-1.935	.055
2.Rado	-.027	.036	-.071	-.753	.453
3.TV	.032	.047	.065	.681	.497
4.Fellow Grower	-.063	.036	-.174	-1.733	.085
5. Agriculture Instructor	-.003	.034	-.008	-.088	.930
6. Private companies	-.071	.046	-.131	-1.541	.126
7.Botanic Garden Officer	.080	.047	.214	1.703	.091
8.Exhibitions	.082	.048	.204	1.714	.089
9.Publications	.024	.036	.062	.660	.511
10.Internet	.039	.034	.116	1.145	.254

a. Dependent Variable: overall tech

Table 12 represents the coefficient values of each dependent variable representing the strength and the direction of the relationship between the dependent variable with each independent variable. According to the table, none of the p values is less than 0.05. Therefore, there is no any significant relationship between the information sources and the overall technical knowledge.

However, the future extension activities have to be designed to motivate the growers to make use of the relevant information sources. The extension service should provide the growers with needed technical information through the relevant information sources when necessary to

overcome the problems. This would strengthen the relationship between the information sources and the technical knowledge of the growers.

4. **Conclusions and Recommendations**

The floriculture growers in the Central Province of Sri Lanka use different information sources to receive needed technical knowledge to develop their knowledge. Depending on the situation, different information sources provide them with trustworthy, useful and timely information. Among those information sources, they receive quality information from the extension officers of the Department of National Botanic Gardens (DNBG) and the fellow growers. Therefore, it is recommended to provide all necessary quality information to the growers through the DNBG. The DNBG should develop a proper mechanism or an approach to coordinate necessary institutions to provide proper information to the growers. Development of the floriculture industry in Sri Lanka is a mandatory function of the DNBG (The Gazette of the Democratic Socialist Republic of Sri Lanka, Section 1 (11.10.2006).

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