



A Content Analysis of Farm Information and Infographics in *Pasumai vikatan* Tamil Magazine, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Content analysis is an effective research tool to study the extent of information covered in farm magazines, which act as a comprehensive guide for farmers. The aim of the study is to analyze the coverage, readability ease, mode of presentation, and type and level of infographics published in the Tamil bimonthly magazine *Pasumai Vikatan*. The magazine was purposefully selected based on regional preferences and popularity. A total of 619 articles covered across 64 editions from 2019 to 2021 were considered for the sample study to analyze the basic objective of the extent of farm information, readability ease and also the infographics covered. Inferential statistics were used to analyze percentage and frequency. The research revealed that 64.63 percent of the articles covered in the magazine were based on economics of returns in the past three years followed by articles related to organic farming (35.83 percent) and crop production aspects (35.13 percent). Further, the Flesch Kincaid reading ease was analyzed and the results indicated that the ease of articles ranged between very easy and standard and could be understood easily even by young readers. With respect to format, the articles were presented predominantly in series format (70.24 percent) followed by current news items pertaining to the agricultural sector (66.31 percent). The

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study also identified that the usage of infographics was sparse without much textual information. The authors recommend the usage of modern e-data tools for newsgathering during the pandemic period and also suggest deeper coverage of other recent areas in agriculture and allied sectors.

Keywords: Farm magazines; pasumai vikatan; content analysis; flesch kincaid reading ease.

1. INTRODUCTION

Farm magazines have become one of the important sources of information for farmers and thereby play an important role in technology transfer. Especially new-age farmers and literate farmers usually depend upon various kinds of media in knowledge acquisition. Among them, farm magazines and newspapers play a prominent role in the dissemination of information and serve as a reliable platform for knowledge acquisition and sharing. They act as a comprehensive guide by bringing to its readers the latest techniques of crop production and protection, new-age technologies, sustainable agriculture, and other guidelines necessary for farming. In short, they act on par with the extension functionaries in technology transfer.

However, there is only a handful of farm magazines that cater to the needs of the farmers and meet their demands. Hence it is imperative to analyze whether the data or information covered in them meets the expectations of the farm community. In order to fulfill this demand, content analysis can be used as an effective tool for research [1,2]. It can be used with a variety of data sources, including textual data, and visual and audio data. The methodology is also highly flexible and hence can be analyzed both empirically and theoretically. Given the massive explosion in archived linguistic, photographic, video, and audio data arising from the proliferation of technology, the technique of content analysis appears to be on the verge of a renaissance [3]. Using content analysis, we can determine the extent to which changes should be made in the textual and visual presentation so that it could help in effective information dissemination.

Considering the above parameters, for the purpose of the research study, *Pasumai Vikatan*, a Tamil bi-monthly magazine was purposefully selected based on the regional preference of the audience and popularity among the masses. The magazine is one of the sub editions of the Vikatan groups and is immensely popular among farmers for its diverse content on farming and

allied activities. Founded in 1926 by late Budalur Vaidhyanadhaiyar and later in 1928 S.S Vasana bought the rights and relaunched the publication. Though it has an online edition only the print edition of the magazine was purposefully selected for the research.

The research intends to analyze the text-based and graphics-based content covered in the magazine. This paper focuses on the following objectives.

1. To study the extent of coverage of farm information in the magazine
2. To study the readability ease
3. To identify the level and type of infographics used.

2. MATERIALS AND METHODS

This research is based on a quantitative study carried out using the content analysis method. Content analysis can be both quantitative and qualitative. Quantitative content analysis (QCA) involves systematically categorizing texts or visuals, that are coded and analyzed. Researchers can then make inferences about the message within the texts. Key steps include a selection of the universe (sample to be studied, say newspapers, magazines, video content, audio clips, etc), dividing the contents into various subcategories, coding, reliability testing, analysis, and findings and discussions. Data was collected from the contents published in the magazine for a three-year period between January 2019 and August 2021. The popularity of the magazine among the farmers and their regional representation was considered when selecting the magazine. A total of 619 articles covered across 64 editions were analyzed for knowing the extent of farm information covered, mode of presentation, readability, and the level and type of infographics. In order to conduct the content analysis, after careful study of the farm magazine under study, the data were categorized based on the various areas covered in agriculture and allied sectors. Similarly, the format of the presentation was categorized as interviews, series, current agricultural news, and Q and A section.

Percentage analysis was carried out to perform the basis of content analysis and the frequency and percentage were calculated for every category.

Readability is another important dimension of any print material which signifies the acceptability of farm information. For the readability index, a software tool called 'WebFX' was used, and 'Flesch Kincaid reading ease' was calculated. The Flesch index (RE) can be calculated by the formula:

$$RE = 206.835 - 1.015 \left(\frac{\text{Total words}}{\text{Total sentences}} \right) - 84.6 \left(\frac{\text{Total Syllables}}{\text{Total words}} \right) \dots \dots \dots (1)$$

Reliability test for the process of categorization and subcategorization is essential in content analysis which helps in the extent of consistency under study. Krippendorff's Alpha [4] has been calculated for establishing reliability. For this purpose, the researcher and two other observers were taken and the observed disagreements and expected disagreements were measured. The thumb rule is that if alpha is 0.8 and above the subject under study is considered reliable. The value of alpha was calculated as 0.823. Hence the process of categorization and subcategorization was found to be reliable.

To analyze the coverage of infographics, a total of (n=145) infographics was identified using a consecutive sampling method. The selected infographics were categorized based on the level

and type of infographics. The study modified the parameters of Ghode [5], Shin (2016), and Welhausen, (2015) into Level 1, which includes tables or bullet points, bar, pie or poll graph, line or fever-line, organizational or procedural flow chart; Level 2 includes themes or graphics or drawings such as conceptual diagrams, maps, typography, and symbolic interpretations and Level 3, is a combination of level 1 and 2 coupled with illustrations, stylistic representation of information.

3. RESULTS AND DISCUSSION

3.1 The Extent of Farm Information

Various studies of newspapers and magazines found that each of them had a preferential selection for publication of different categories of farm information.

All aspects of agricultural and allied activities were covered in the magazine. It could be inferred from Table 1 that 64.63 percent of the articles were regarding the economics of returns followed by extensive coverage of organic farming (35.13 percent). Articles regarding crop production were given more prominence at 35.13 percent. The study also revealed that less priority was given to emerging areas such as agro-tourism (3.57 percent.) Similarly, articles related to allied sectors such as apiculture and sericulture were not covered adequately (7.80 percent).

Table 1. Extent of coverage of farm information

Category	Year 2021		Year 2020		Year 2019		Total	
	No	Percent	No	Percent	No	Percent	Total No	Total %
Organic farming	15	11.28	26	13.26	41	14.28	82	35.83
Crop production	14	10.53	25	12.76	34	11.85	73	35.13
Crop protection	7	5.27	12	6.12	19	6.62	38	18.00
Horticulture	18	13.53	14	7.14	32	11.14	64	31.83
Medicinal	2	1.50	23	11.73	21	7.32	46	20.56
Water management	5	3.76	14	7.14	17	5.92	36	16.83
Economics of Returns	45	33.83	33	15.82	43	14.98	121	64.63
Animal husbandry	10	7.52	20	10.20	25	8.72	55	26.43
Apiculture/Sericulture	1	0.76	7	3.57	10	3.48	18	7.80
Agro tourism	2	1.50	3	1.02	3	1.04	8	3.57
ICT	3	2.26	8	4.08	11	3.84	22	10.17
Farm insurance	5	3.76	5	2.56	14	4.88	24	11.19
Farm machinery	2	1.50	4	2.04	5	1.75	11	5.29
Seed technology	4	3.00	5	2.56	12	4.18	21	9.74
Total	133	100.00	199	100.00	287	100.00	619	300.00

The findings revealed that more prominence was given to stories on the economics of returns featuring various success stories. The stories depict the various entrepreneurial opportunities in agriculture and allied sectors and feature success stories of farmers and agripreneurs who managed to earn considerable income and emerged successful in various agripreneurial activities. It was also revealed that organic farming and terrace gardening were given ample coverage in the majority of the issues. Animal husbandry was also given a substantial coverage at 26.43 percent.

However, the research identified that emerging areas such as Information and Communication Technology, agro-tourism, water management, farm insurance, nanotechnology, and other modern agriculture technologies require more coverage. Agriculture is moving towards an era of technology and embracing many modern methods in crop production and protection is essential. Areas such as artificial intelligence are supporting different sectors to boost productivity and efficiency and assisting to overcome traditional challenges in every field. Focus on data management, market intelligence, market information system, and e-marketing require wider awareness among farmers, especially, after the Covid 19 pandemic [6-9].

Hence the magazine should concentrate on such areas which have been, hitherto, sparsely covered.

3.2 Mode of Presentation

Agricultural information was presented in the magazine through different modes to farmers.

News stories, feature stories, success stories, and interviews are some of the formats used by various farm magazines. An attempt has been made to classify the articles according to certain formats and is presented in Fig. 1.

The magazine has been publishing articles in various formats such as interviews, series, etc to cater to the varied interests of the readers. The above figure 1 shows that the series format has been used widely at 70.24 percent followed by current news items pertaining to the agricultural sector at 66.31 percent. The editorial section occupies a regular coverage in all the editions at 38.97 percent. Various other formats such as Q and A section and interviews on select successful farmers or celebrities too are given wider coverage.

3.3 Readability Analysis

Readability is an important factor that decides the effectiveness of the publication. As Wilson and Gallop, (1954) have pointed out unless a reading material is easily understood, it cannot be an effective teaching device. Being a farm magazine and as the readers are predominantly farmers, it is imperative to assess the ease of reading for better outreach. Though there are several indices to measure the reading ease, it was decided to use the Flesch readability formula (1948). The readability scores obtained from the analysis are explained in detail in Table 2. News articles covering 10 percent of the issues were randomly selected and analyzed to assess reading ease.

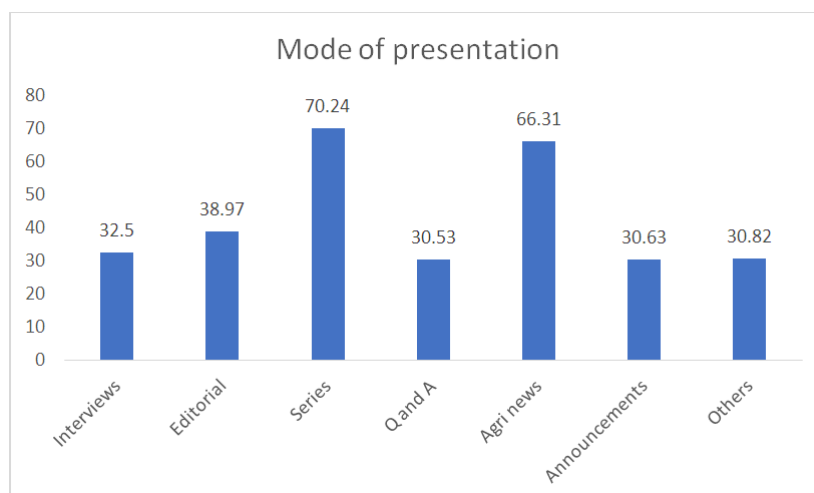


Fig. 1. Distribution of mode of presentation in the magazine

Table 2. Readability Scores obtained from the magazine

Article	Flesch Score/ Flesch Index	Percent of Complex words	Average words per Sentence	Grade	Result
Item 1	104.1	6.72	2.73	3	Easy
Item 2	98.90	6.76	2.71	3	Easy
Item 3	99.90	6.38	2.79	3	Easy
Item 4	97.40	6.73	3.082	2	standard
Item 5	96.30	7.13	2.92	2	standard
Item 6	100.9	5.94	2.76	3	Easy
Item 7	100.3	6.23	2.93	3	Easy
Item 8	96.30	6.62	2.76	2	standard
Item 9	104.2	4.59	3.15	4	Ext. easy
Item 10	97.90	6.52	2.95	2	standard
Item 11	101.6	5.68	3.46	3	Easy
Item 12	94.40	8.00	4.06	2	standard
Item 13	98.10	6.82	2.76	2	standard
Item 14	100.3	6.26	2.79	3	Easy
Item 15	97.60	7.05	2.63	2	standard
Item 16	103.1	4.71	3.71	3	Easy
Item 17	96.00	7.65	2.55	2	standard
Item 18	100.00	6.33	2.69	3	Easy
Item 19	98.80	7.14	2.63	3	Easy
Item 20	99.20	6.62	2.65	3	Easy

Table 3. Level and type of infographics covered in the magazine between 2019-2021

Level	2021	2020	2019
Level 1	5	10	10
Level 2	20	40	30
Level 3	5	12	13
Total count	30	62	53
Type	2021	2020	2019
Text-centred	16	32	30
Graphic-centred	14	30	23

It could be seen from the above Table 2, that the published articles can be classified under three categories namely extremely easy, easy, and standard. None of the articles were hard to read and written in simple language. The results indicated that the articles were easy to read and interpret.

3.4 Level and Type of Infographics

Since the 1980s, the use of infographics became important in journalism. By the year 2000 infographics became a boom in the newsrooms. Since 2009 there has been a rise in the use of infographics. The coverage of infographics in newspaper or magazine can enhance the reading experience and brings depth to a story [10-12]. It is also seen as a replacement for photographs and attracts the readers. Readers tend to read and examine graphics before reading the text, and bigger graphic draw the

readers to the story and also enables them to highlight fewer important details. [13-15] (Siricharoen, 2013).

The magazine had predominantly used level 2 infographics (n=20,40 and 30) in all the three years respectively. Level 2 includes themes or graphics or drawings such as conceptual diagrams, maps, typography, and symbolic interpretations. Most of the graphics were used in series and for the purpose of announcements regarding farming. Unlike its main edition, infographics are sparsely used without much textual information.

4. CONCLUSION

The results and data analysis shows that being a popular magazine in the state of Tamil Nadu, it should not restrict its focus to only success stories and economics of returns. Some of the

areas such as the economics of returns are given much coverage whereas the focus on areas such as ICT, Artificial intelligence, etc needs improvement. Research and development in recent areas need to be reported more and requisite importance should be given to areas such as nanotechnology, plant breeding, and other unexplored divisions in agriculture. Expert talks from renowned scientists will add to the reliability of the articles.

The concept of infographics has been neglected much and the magazine should focus on providing informative infographics that would capture the readers' attention and give an in-depth analysis of the story. With agriculture given prominent importance now at the national level, the content could be revised and updated instead of following a monotonous pattern. A fair proportion of news articles should be given to all areas in the agricultural sector.

The study also identifies that the coverage of articles was relatively less during the Covid 19 pandemic due to lack of access to farmers, and insufficient staff among many others. Usage of e-data collection tools in newsgathering would help in filling the gaps in newsgathering.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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