ANALYSIS OF READING COMPREHENSION OF AGRICULTURAL ARTICLES IN DAILY NEWSPAPER BY FARMERS IN KERALA STATE
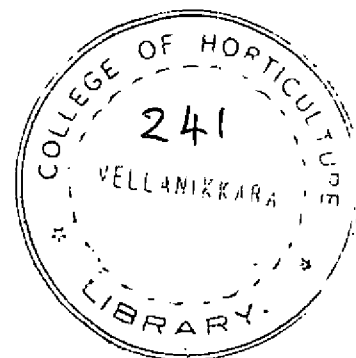
By

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CERTIFICATE

This is to certify that the thesis entitled "ANALYSIS OF READING COMPREHENSION OF AGRICULTURAL ARTICLES IN DAILY NEWSPAPER BY FARMERS IN KERALA STATE" submitted by Mr.Ranjan.S.Karippai, for the degree of DOCTOR OF PHILOSOPHY in AGRICULTURAL EXTENSION of the University of Agricultural Sciences, Bangalore, is a record of research work done by him during the period of his study in this University under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar titles.

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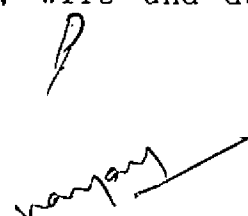
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Introduction

I. INTRODUCTION

Mounting inequalities in distribution of technological achievements and economic benefits is a matter of debate round the globe, particularly in developing nations. In a community, modernization and social justice have to be closely interwoven with development communication efforts for effectively combating the disparities in such distribution. In a discourse on the process of transfer of technology, none can overlook the importance of various media and their use to suit the specific information needs of the clientele.

A detailed review of the communication process in development perspective yielded some glaring deficiencies of the current situation such as the quantitative shortcomings with regard to availability and access to development communication in terms of its orgination, transmission and perception, and qualitative inadequacies with regard to the content and treatment (Sethu Rao et al., 1987).

A well identified constraint of the development communication media, particularly mass media, is that they are quite often urban-biased and urban-based in their content and treatment. This is very much true in the case of press as a medium of development communication, as it functions mainly under private sector or corporate sector in most of the developing nations.

Notwithstanding these, the print medium is considered to be powerful in development communication. UNESCO (1982), in its report on communication and society, categorically stated that:

> " While it is often said that we are entering 'the electronic age' there is, for instance, no sign of the demise of the print media. Newspapers, magazines and books will continue for decades to be the major source of information, knowledge and pleasure; efforts should be made to ensure their continuity, to increase their quantity and to improve their quality."

While discussing the 'power of the press', the UNESCO report further explained that the 'fourth estate' is important in the democratic process by moulding public opinion and concurrently relevant in development process by its role in transfer of technology. Moreover, newspaper has the advantages of commonness and relative low cost, as identified by Phillips (1982).

Statement of the problem

The role of the press in development communication is very much significant in places where the literacy levels are relatively high. In such places, newspaper reading gets intertwined with daily habits for most of the people and attains the status of a very popular mass medium. However, probably due to the overemphasis on politics and sensational issues, credibility of this medium for development information is estimated to be low among the rural population (Karippai 1981). It is estimated that the combined

circulation of daily newspapers in Kerala, the state which ranks first in literacy (above 70 per cent) in India, exceeds one million for a total population of over 25 million, according to the 1981 Census Hence, this medium is considered to be very potential in the dissemination of technology in Kerala State.

Realising the influence of the print medium in Kerala, there is a mushrooming of newspapers in the State, many of them fading out after a short span of time, to carry a host of dogmas across the society. Kerala press, on existence now for almost one and a half centuries since the starting of the first Malayalam newsmagazine "Rajyasamacharam" under the editorship of the German scholar missionary, Dr. Gundert, has now 88 daily newspapers on rolls according to the report of the Government of India (1987). Out of this, five dailies have a circulation of over one lakh copies and six dailies have a circulation between 15,000 and 50,000. Further, six Malayalam dailies have more than one edition, printed from different places in the State.

The Kerala press started publication of agricultural columns on a regular basis in 1975, initiated by 'Mathrubhumi' and followed by 'Malayala Manorama' and several others. Currently there are 18 dailies regularly devoting one full page or half-a-page every week to carry agricultural articles. The articles are usually contributed by

agricultural scientists, extension personnel, progressive farmers and other freelance journalists.

In spite of their wide coverage and importance in the powerful medium like press, agricultural columns have seldom been put to systematic analyses to know how far these columns do justice in their content or treatment. As pointed out by Karippai and Menon (1987), only very few attempts have been made to gather empirical data on the readership, readability, reading comprehension or impact of these columns. The absence of such evidences limits the scope for a critical discussion on the effectiveness of agricultural columns and ways to improve them. This is particularly important in an era of 'communication revolution' wherein various media compete with each other in carrying information in the most efficient way, along with their complementary interrelationships. As UNESCO (1982) suggested:

> "All sorts of technological innovations have accompanied or had their roots in the explosion of mass media, which opened the doors to larger audiences, expanded sources and resources for information and entertainment and supported important cultural and social changes. While it is obvious that mass media have widespread positive effects, the phenomenon of their growth is of such importance that much more research is necessary .... fundamental research in all countries should provide the framework for future development of communication".

It is quite apparent that a clear understanding on how far the contents and treatments suit the readership tastes

and needs, how far they are received by the intended readers and which are the factors influencing this reception would be essential to initiate a dialogue on the further improvement of agricultural columns. Here, a research study was planned to assess the extent of reading comprehension of agricultural articles by the farmers, and its relationship with their personal characteristics as well as the text characteristics of the articles, to have a reliable information on the present status of the agricultural columns among the farmer readers.

Objectives of the study

The general objective of this study was to know the levels of reading comprehension of agricultural articles in dailies by the farmers. In that line, the study was designed with the following specific objectives:

1. to develop a measurement index for reading comprehension of agricultural articles in daily newspapers,

2. to measure the reading comprehension of agricultural articles in daily newspapers by farmers,

3. to identify the relationship between the selected personal characteristics of farmers and their reading comprehension of agricultural articles,

4. to find out the influence of text characteristics on the reading comprehension of agricultural articles by farmers, and

5. to identify the variation of different formats of agri-
    cultural articles in terms of their reading comprehen-
    sion by farmers.

Scope of the study

This study was, probably, the first of its kind to
systematically analyse the levels of reading comprehension of
agricultural articles in an Indian language daily newspaper
with the help of a rational and scientific measurement
device. Further, it tried to make relational analysis of
reading comprehension with selected readers' characteristics
as well as selected text characteristics, to know how far
reading comprehension would be influenced by those factors.
Corollary to this effort, an attempt was also made to study
various sub-dimensions of the reading comprehension process
in relation to the selected personal characteristics of
farmers, to get additional fruitful revelations. This apart,
the analysis of variance between different formats of
articles was also carried out in terms of their reading
comprehension to gather some valid data on the usual formats
appearing in the agricultural columns of dailies. Quite
evidently, this study might form a basis for the scientific
inquiries in the field of agricultural journalism in Indian
languages and invoke practical thoughts for further
refinement of the agricultural articles to suit the
readership profiles.

Limitations of the study

Any human effort, however earnest it may be, is not devoid of limitations. This research study was also no exception to this truth. One of the obvious limitations was that of resources and time available at the disposal of the researcher, to conduct a student research project of this magnitude. Restriction of the sample size to make it wieldy for instantaneous data collection to suit the theoretical propositions by the lone researcher might also have become a limitation to make better generalisations based on the findings.

The expost-facto analytical design used in this study was also inevitable due to inherent peculiarities of the research problem. To some extent, natural biases of the respondents might have cropped in, eventhough utmost care was taken to eliminate such extraneous factors.

In addition, this study being a pioneering effort in this line with several new variables with standardised or arbitrary measurement devices, though having generated several relevant results, might be inconclusive in reaching final judgements.

Presentation of the study

The study is presented in six chapters. The first chapter deals with the introduction covering the statement of the problem, objectives of the study, scope of the study and

limitations of the study. The review of related literature and a conceptual framework are given in the second chapter. The third chapter contains the methodology of the conduct of the study. The results are presented in the fourth chapter, while the discussions on the findings are made in the fifth chapter, followed by the summary in the sixth.

Review of literature

II. REVIEW OF LITERATURE

A scientific inquiry is always built upon the foundations of the knowledge accumulated through various efforts in the past. Review of all such efforts, either theoretical or empirical, would help to outline the new problem area and develop a conceptual framework for the study. Here, an attempt is made to review the available literature, directly or indirectly related to the study. This chapter contains, in accordance with the objectives of this investigation, the review of literature in the following lines.

1. Concept and importance of reading comprehension.
2. Measurement of reading comprehension.
3. Influence of personal characteristics of readers on reading comprehension.
4. Influence of text variables on reading comprehension.

In addition, an effort is made to develop a conceptual framework along with a set of hypotheses for testing in this investigation.

2.1 The concept and importance of reading comprehension

The extent of use of print medium is necessarily based on the principles of effective reading and the extent to which the matter is comprehended effectively. The analysis of theories of reading indicates they are being developed independently by a variety of disciplines. On the one hand,

there are educational psychologists, psycho-linguists, and reading researchers and on the other hand, philosophers, literary critics and rhetoricians. Each of these 'schools' is only minimally aware of the others.

When the print is considered as a means for transfer of technology, one has to take principles of cognitive psychology and reading research into consideration, as it takes the readers' mental processes also into account. As Tinker and McCullough (1962) summed up their definition,

> "Reading involves the recognition of printed or written symbols which serve as stimuli for the recall of meanings built up through past experiences, and the construction of new meanings through manipulation of concepts already possessed by the reader. The resulting meanings are organised into thought processes according to the purposes adopted by the reader. Such an organisation leads to modified thought and/or behaviour, or else leads to new behaviour which takes its place, either in personal or in social development".

Concept and importance

The objective of all sorts of reading is the comprehension of its content. From introduction to reading in the first standard, an individual tries to deveolop the reading skills for better comprehension and achievement. Several researchers have emphasised the importance of comprehension in reading a passage that makes the reading useful and pointed out that comprehension is always determined by personal characteristics of readers.as well as the text qualities.

A major concern here is that to what extent a written communication is comprehended by its readers and how the passage can be modified for better comprehension. Serra (1953), while reviewing concept learning and verbal representations by school children, stated that the failure of a child to acquire concepts through reading may arise from poor choice of expression by the author rather than from the weakness of the child. This focusses on the quality of the written communication rather than the ability of the reader. If higher reading comprehension is to be the aim of any written communication, the matter has to be produced in a better comprehendable form. In addition, there is a need to have an objective means to measure this to ensure that the written communication is comprehendable to the intended audience.

As a process, reading comprehension can be viewed as a complex of intellectual abilities and skills of an individual reader that helps him to get the message of what is read. Bloom (1956) defined the term comprehension as "to include those objectives, behaviour or response which represent an understanding of the literal message contained in a communication". In reaching such an understanding, the reader may change the communication in his mind or in his overt responses to some parallel form more meaningful to him. Bloom further considered three types of comprehension behaviours contained in the total comprehension processes, namely translation, interpretation and extrapolation.

While using concept approach as the basis for extensive studies in learning, Bruner et al. (1956) viewed comprehension of a concept as the proper classing and categorising of particular information to give its meaning in terms of other information.

Summarising the review on readability studies and suggesting the lines for future research, Klare (1963) pointed out that the studies on reading comprehension, learning or retention were important than other areas of reading behaviour, as they contained more number of the human factors as well as the text factors.

Felstehausen (1965) stated that comprehension of technical concepts implied the denotative meanings which were the associations between the words and objects.

Reading comprehension is not only an understanding of the message in the written communication or a recall of the ideas contained in the matter read. As Tinker (1965) explained, it is a process within the individual, in which the meanings of sentences, paragraphs and larger units of passage are grasped by the individual along with the relation ship between words, groups of words, thought units, sentences and paragraphs. It also involves the interpretation of topical sentence in a paragraph in relation to the separate-explanatory or amplifying sentences.

Analysing the reader efficiency, Bormuth (1969) gave a definition that "comprehension skills are a set of genera-

lised knowledge acquisition skills which permit people to acquire and exhibit information gained as a consequence of reading printed language." Meanwhile, Mosberg and Shima (1969) viewed reading comprehension as a complex information processing event.

Some scientists viewed reading comprehension in terms of memory and recall of a message. As Caroll (1972) suggested, "there is little use in comprehending a message unless the outcome of that comprehension is remembered and transferred to long term memory". A similar observation was made later by Sticht et al (1977) also, when they identified two types of reading tasks such as reading-to-do and reading-to-learn. Reading-to-do task involves reading with a specific narrowly defined objective and for immediate application, and here reading is a subtask of a specific job task. In reading-to-learn, the objective is to store and retain what is read for use at another time. In reading-to- do task, reader goes to the text with a question in mind and when he finds that information, the comprehension is limited to that extent to remember it for only a brief time. In both these cases, reading comprehension takes memory requirement into account, and suggests that it necessitates greater comprehension in the sense of deeper and more elaborate processing of the information.

While explaining the effect of communications on attitude change, McGuire (1973) stated that message comprehension

constituted an important step in persuasion process, and the receiver (reader) is more likely to be influenced by the message if he understands the content. "It is obvious that the more the person comprehends, the more he should tend to be influenced by it".

According to Marks et al. (1974) reading comprehension begins with a set of decoding skills which enable the reader to relate the printed words to his previously acquired vocabulary. The use of highly meaningful reading material elicits the individual's previously learned associations and allows him to predict his ways through the text.

Later, another school of thought developed which considered memory, retention and recall as individual abilities that could be segregated from reading comprehension, which is a temporal process. Fass and Schumacher (1978), in this connection found that simplification of text facilitated comprehension even when the readers did not know what information in the text had to be learned, or for what memory was required.

Describing the importance of the reading comprehension studies, Duffy and Kabance (1982) indicated that the inability of a text can be described in terms of its access, accuracy, completeness and comprehendability where the last trait was the most troublesome and currently receiving greater attention. In these lines, Samuels (1983) also pointed out that reading of a printed communication material

should be considered as the active construction of the text's meaning, proceeding from an interaction between the writer and the reader.

All these reviews amply bring out the need and importance of the study of reading comprehension as a prime factor in effective use of print media in any communication situation.

2.2 Measurement of reading comprehension

The study of reading comprehension was mostly confined to classroom learning situations and its measurement tools developed by researchers were generally for classroom instruction and educational psychology. These tools have often been adapted to reading research and studies in journalism.

Readability

Earlier, readability of a passage has been associated with the concept of comprehension. If the statement that a passage is 'readable' means it is 'understandable', then the scores that measure readability should measure comprehension (Taylor, 1953). But Marshall (1957) after his study reported that Reading Ease formula did not predict difficulty in the comprehension of high school physics text books.

Klare (1963) explained that a readability formula was referred to a method of measurement intended as a predictive

device that would provide quantitative and objective estimates of the style difficulty of writing. He further suggested that effective use of a printed matter was influenced not only by its readability, but also by the readers' education level, background knowledge, level of motivation and other such factors. He rightly pointed out that a more readable writing did not always mean better comprehension unless the other factors were also looked into and an increase in readability might not produce a corresponding increase in comprehension.

Nestvold (1972) also asserted that the readability formulae did not measure stylistic or organisational features of passages and confine to physical characters of text such as word length, sentence length and use of common words or personal words.

While discussing on readability formulae, Kintsch and Vipond (1978) remarked that the readability formulae failed to enlighten us as to what makes a text difficult to understand and why texts having the same readability levels might vary widely in the degree to which they can be comprehended. Dupuis (1980) also expressed a similar opinion and pointed out that readers' background, interest level, ability to draw inference and ability to respond imaginatively were highly involved in successful reading, which were not taken into account by readability formulae.

In the same line, Duffy and Kabance (1982) stated that readability formulae could not make significant assessments on the comprehendability of a text. Bostian and Byrne (1984) concluded that reading comprehension was quite distinct from readability of a text in the context of practical use in text improvement.

Cloze procedure

The 'cloze procedure' (Taylor, 1953) to assess reading comprehension received considerable attention, as it could overcome the limitations of earlier readability formulae. The essential feature of this technique is the deletion of every 'nth word' in a passage which the reader is to fill up on the basis of the context clues. It was assumed that a respondent with a higher cloze score comprehended the verbal structure better than a respondent with lower cloze score.

After reviewing the research on cloze techniques, Potter (1968) hypothesised that cloze scores based on function word deletions were likely to be related to syntactic complexity, and the cloze scores based on content deletions were likely to be related to information load.

In cloze procedure, highly redundant text obtain higher scores since deleted words are easy to fill up on the basis of remaining context, and tightly written matter (such as technical articles) would lose the score considerably (Della-Piana and Endo, 1973).

Zinkhan and Blair (1984) rightly indicated the need of equal length for comparison of passages with cloze scores, which reflects the obvious relationship between total cloze score and passage length. They further stated that passages of unequal lengths could be compared by converting cloze scores into percentages, still factors such as differential respondent fatique or differential total context available might threaten subsequent comparisons.

Multiple - choice tests

In several situations, reading comprehension has been measured using Multiple-choice tests or Achievement tests. But the adequacy of such measures was questioned by two independent sources (Bormuth, 1969; Tuinman, 1970). Both investigators expressed concern over the questions in such tests which the respondents can answer even without having read the passage. Tuinman (1970) cited a series of studies which demonstrated that subjects were able to answer passage questions without having read that passage.

Guessing game technique

Another method of measuring reading comprehension was devised by Coleman and Miller (1968), whose technique was an adaptation of Shannon's (1951) "Guessing Game Technique". In this method, the subject was asked to guess the first word in a passage, and if incorrect, given the right answer and then the next word was guessed and so on. Then the passage was

given for a second time and information gain was considered as the difference between correct number of guesses per 100 words.

· Recall test

Some studies on reading comprehension were conducted using test of recall of specific words and sentences from the passage read (Anderson et al., 1971), with the assumption that storage and recall might be a function of reading comprehension. But as mentioned elsewhere earlier, memory, retention and recall were considered to be individual abilities and segregated from reading comprehension by several scientists.

Studies in agricultural journalism

Felstehausen (1965) made use of twelve multiple choice questions, fifteen completion questions and a special type question to assess the comprehension of economic terms by Netherlands farmers.

Many studies conducted on comprehension of printed farm messages at the University of Wisconsin, Madison, USA used multiple-choice questions or cloze procedure to measure reading comprehension. Yard (1971) adopted multiple-choice questions to measure the comprehension of home economics terminology. Taylor (1976) and Zeier (1977) also used the same method in their studies in home economics journalism. In a recent study by Thering (1986), cloze procedure was

considered to measure the reading comprehension of technical articles by scientists.

The reviews presented here indicate a diversity in the measurement of reading comprehension, of course with their inherent limitations. These measures also indicated the need for a comprehensive measurement device, particularly in the field of development journalism.

2.3 Influence of personal characteristics of readers on their reading comprehension

There are several studies, particularly in the field of educational psychology, assessing the influence of personal traits on reading comprehension. But in a review of vocabulary studies in education, Dale (1956) has pointed out that in a review of research " what we especially need are studies of specialised areas-technical fields- and the like". Here also, the studies which are related to reading comprehension of printed farm information only are reviewed, and wherever they are found deficient in relation to some variables, related studies from other fields are quoted.

Age

Felstehausen (1965) in his study on economic knowledge and comprehension among Netherlands farmers observed an inverse relationship of age to the level of comprehension and economic understanding.

While studying the comprehension of swine terms and concepts of Wisconsin farmers, Baxter (1967) also found a significant difference between age groups.

Another study by Crosiar (1975) on the comprehension and readability of pesticide lables, conducted among farmers and their wives in Dane county, Wisconsin, revealed that age was inversely related to comprehension.

Sokomba (1977) in his study on the use of extension publications by the extension workers in Nigeria reported that age was a crucial factor influencing extension workers' readership, use and understanding of publication contents.

In her study on use and comprehension of nutritional labelling, Zeier (1977) also found a significant influence of age on lable comprehension.

As against these findings, Sharma (1983) reported a non-association of age with reading comprehension, while studying the readability, content and usefulness of 'Krishi Vignana', a farm journal in Kannada language.

Sawant et al. (1984) also revealed that age was not a significant factor to influence the farmers' perception of readability of a printed farm message in Marathi language. Here, farmers' perception of readability is considered to imply the reading comprehension indirectly.

In their experimental study, Siddaramaiah and Rajanna (1984) found a significant influence of age on increase in

overall knowledge of the farmers, which was considered to include recall and comprehension, while studying the relative effectiveness of various media combinations.

All these studies, barring two, indicated the influence of age on reading comprehension of farmers. Hence, it would be worth to test the relationship of age with the reading comprehension of agricultural articles by farmers, in this study also.

Education

The study conducted by Fonseca (1959) about the comprehension of pictorial symbols by the members of youth clubs in America and Brazil revealed that the comprehension was highly influenced by their levels of formal education among the Brazilian respondents. The study further indicated that no relationship was existing between education and comprehension among the American respondents.

Baxter (1967) also reported a strong relationship existed between the comprehension scores and levels of education of the swine farmers in Wisconsin.

In a study conducted in Bangalore, on 'the reading comprehension of agricultural publications, Zalaki (1973) found no association between farmers' education and their overall reading comprehension.

However, positive relationship was observed between

level of education and comprehension of labels in the studies by Crosiar (1975) and Zeier (1977).

Munegowda (1978) also reported a significant association between the level of education of farmers and their reading of agricultural messages in newspaper.

Kaur (1982), while studying the comprehension and use of information from a correspondence course by farm women in Punjab, found positive and significant relationship of education of respondents with their reading comprehension.

In his study on the readability of a Kannada farm journal 'Krishi Vignana', Sharma (1983) identified that there was no association for education with reading comprehension by the farmers.

Sawant et al. (1984) found a positive relationship of education with perception of readability in their study on the readability of printed farm information in Marathi language.

Similarly, Siddaramaiah and Rajanna (1984) also found a significant influence of education on overall knowledge level of farmers comprising recall knowledge and comprehension knowledge.

A recent study conducted by Karande and Riswadkar (1987) in Maharashtra indicated a significant association of educational level with the use of print media in getting modern

animal husbandry practices by scientists and extension workers.

The studies cited here, except two, indicated a significant influence of education on the reading comprehen- sion of various farm messages or use of print medium. It would be interesting to explore the relationship of the level of education of farmer readers with their reading comprehension of agricultural articles in newspapers, and thus this variable was also included in this study.

Mass media exposure

The studies assessing the influence of mass media exposure on the reading comprehension are found to be meagre. However, Felstehausen (1965) observed that comprehension was higher among persons with higher use of mass media in Netherlands.

The study by Crosiar (1975) tested the influence of television viewing on the comprehension levels of pesticide labels by Wisconsin farmers and housewives. This revealed an inverse relationship between television viewing and label comprehension.

In his study on readability of a Kannada farm journal, Sharma (1983) reported that there was no association between mass media exposure and reading comprehension.

Siddaramaiah and Rajanna (1984) reported a positive and significant influence of media participation on the overall

knowledge of farmers, comprising recall knowledge and comprehension knowledge.

In another study by Noe (1986) on metacognitive awareness in job related reading, it was found that the use of non-print information sources influenced job related reading activity. This study implied that the reading of occupation related information by any individual demands a metacognitive awareness of his reading for the job, which may be encouraged by the exposure to other information sources.

These studies give contrasting clues about the association of mass media exposure and reading activity. So, it would be useful to test the influence of exposure of farmer readers to mass media on their reading comprehension of agricultural articles in newspapers.

General reading habit

General reading habit is a seldom studied aspect as an independent variable in most of the studies on print media use, though it seems to be an important one.

The study by Crosiar (1975) revealed a positive correlation of magazine reading of Wisconsin farmers and housewives with their comprehension of pesticide labels.

In a study on semantic and syntactic bases of text comprehension, Rosebery (1985) found that reader skill interacted with semantic entailment in the text to produce

significant improvement in passage comprehension. In this case, reader skill can be considered as a resultant effect of higher reading habit. The study further emphasised that skilled readers were more efficient in analysing the semantic relationships present in the passage.

Another study on the effect of reading and writing composition activities by college students (Donelly, 1986) explained that the reading and writing activities helped to improve transference of skills. She further indicated that this helped not only to improve reading comprehension and vocabulary, but also to develop positive learning attitudes.

In contrast, Guiser (1986) reported that there was no significant correlation between recreational reading, in terms of number of books read, and the reading achievement of fifth and sixth grade students.

These studies, except one, though most of them are not in the field of agricultural journalism, throw limelight to the chances of an important effect of general reading habit on reading comprehension. Hence, it was decided to put this variable to test in this study.

Reading habit of agricultural articles

Felstehausen (1965) suggested that reading habit of agricultural articles with specific farm examples and farm concepts would help reading comprehension ability of farmers. He also pointed out that much of the technical information in

Netherland farm papers suffered from lack of association with specific farm examples and was written with theoretical concepts.

In the study among extension workers in Nigeria, Sokomba (1977) observed that reception of additional information from agricultural newsletters, books, research bulletins, and newspapers was an influencing factor in the reception, reader ship, use and understanding of publication contents by the respondents.

These studies indicate the possibility of a relationship of reading habit of agricultural articles by farmers with their reading comprehension and hence, it was included as an independent variable in this study also.

Social participation

Felstehausen (1965), in his study in Netherlands, found that farmers' comprehension was significantly influenced by their membership in various organisations.

In a study conducted among the subscribers of 'Krishi Vignana', a farm journal of the University of Agricultural Sciences, Bangalore, Jayaram (1980) revealed that there was no association between organisational participation and knowledge gain by reading of the journal. Here, knowledge gain is considered to be a function of better comprehension.

Sharma (1983) also found no association between organisational participation and reading comprehension of agricultural articles by the farmers.

These contrasting reports call for the need of studying this variable for its association with reading comprehension of the respondents and hence, it was considered for this study.

Background knowledge

In a study conducted among Wisconsin farmers on the comprehension of dairy terms by Sperbeck (1967), it was found that the years of experience had no relationship with comprehension of dairy terms.

Anderson (1978), while explaining the schema-directed processes in language comprehension, pointed out that message of a text arises in an interaction between the characteristics of the message and the readers' existing knowledge and analysis of the context.

Aron (1984) revealed that background knowledge had a significant effect on memory for expository prose and in turn its comprehension by native and non-native English speakers.

In another study by Roberts (1986), it was found that prior knowledge was a statistically significant predictor of reading comprehension among eighth grade language arts students.

Again in a study on text book comprehension, Thrope (1986) indicated that readers' prior knowledge could be acknowledged and used as a critical feature in comprehending and learning from the text.

Yochum (1986) examined the effects of background knowledge and text structure on reading comprehension of fifth grade children and found that there were positive effects of the prior knowledge of the topic on comprehension in terms of question-answer performance.

While assessing the effects of metacognitive adjunct questions on reading comprehension, Abernathy (1987) observed a significant influence of prior knowledge of subject matter on reading comprehension by school children.

Head (1987) also found that prior knowledge might be playing at least a partial role in writing summaries by seventh grade pupils, which measured some aspects of reading comprehension as indicated by multiple choice questions and standardised tests.

These reviews indicate that there might be an influence of the background knowledge level of the reader on his comprehension of the message in the printed communication. So it was considered worth testing this variable to assess its relationship with farmers' reading comprehension of agricultural articles, and thus included in this study.

2.4 Influence of text variables on reading comprehension

Availability of research studies was very much limited in the case of the influence of text variables on reading comprehension. However, the available empirical evidences and other theoretical propositions are reviewed here.

Style of writing

If an overview is made on any literature on writing popular articles or writing for mass media, one can easily find the importance given for style of writing. As Patterson' (1949) pointed out long back, the style of writing makes an article readable. She argued for- the need of vivid descriptions, enlivening dry facts with human interest incidents, relating facts to the objects with which the reader would- be familiar and helping the reader to visualise the message so that comprehension would be much better.

Fox (1952) emphasised certain prerequisites in the style of writing of agricultural and technical articles so as to make it comprehendable to the. intended reader. He suggested that clarity and brevity in writing are important for better comprehension and called for simple and short sentences with crisp and concrete words.

While discussing various principles in news editing, Westley (1953) opined that a story can be made more readable if all compound and complex sentences are avoided in the writing style.

Hadley (1955) in his book on agricultural journalism, indicted that, along with other aspects, adding variety in the writing style also would help the people to understand the story.

Illustrating the requirements for a good news report, Macdougall (1963) proposed that the writing style is an important consideration to improve the comprehension of the story. He advocated for conciseness, directness and simplicity through elimination of superfluous words to achieve this.

Describing style of writing as a salient factor in the comprehension of a technical story, Morris (1966) elucidated three style elements such as clarity, brevity and colour as essentials in technical writing.

Kamath (1969) has portrayed the needed qualities of story for farm families and narrated many aspects of style that could help better comprehension. He pointed out that even unfamiliar technical words also could be used in such writings, provided they are well interpreted and explained with familiar words.

Defining a readable story, Ahuja (1979) also mentioned several style elements and exhorted that the story should be written as we talk so that the reader would be able to visualise the story theme.

Calder (1984) studied the effects of story structure instruction on the reading comprehension among third grade pupils and observed that ideal story structure was likely to bring gains in the levels of concept of the story.

In contrast, Ohlhausen (1985) reported that there was no significant effect of text structure on schemata acquisition implying that the structure of text could not be considered as facilitative to reading comprehension. Yochum (1986) also found similar results in her study.

These reviews present vivid pictures on the importance of style of writing in reading comprehension. It would be interesting to test how this variable can influence the reading comprehension of agricultural articles.

Interpretation of meaning

Westley (1953) underscored the need of interpretation of idea in a news story in relation to readers' experience to help its better understanding.

Hartman (1984) studied the predictive relationship of ten writing assessment variables with reading comprehension among ninth grade students. He found that interpretation of meaning was a significant predictor of reading comprehension.

These observations stress the need for studying interpretation of meaning as a text variable while assessing the influencing factors of reading comprehension of agricultural articles.

Emphasis of ideas

While explaining the principles of interpretative writing, Macdougall (1963) highlighted the significance of emphasis of ideas to help comprehension of the message by the readers.

Morris (1966), in his book on technical writing principles, stressed this aspect as an important factor of reading comprehension and delineated various techniques to achieve proper emphasis of ideas in the story for the benefit of the intended readers.

Hartman (1984), while studying the predictive relationship of writing assessment variables with comprehension, found that emphasis of ideas could significantly predict the reading comprehension levels of ninth grade students. These observations call for further studies on emphasis of ideas as a variable that might influence reading comprehension, particularly in the field of agricultural journalism and hence it was included in this study.

Relevance of the message

Relevance of the message can be considered as an important prerequisite for a story to get news value. This is particularly basic in the case of development reporting, in which a sense of persuasion is also involved (Parkinson et al., 1985).

Earlier, Tinker and McCullough (1962) had noted that a proficient reader would easily obtain what he is seeking from the printed material and it would be relevant to him in some or other context.

Macdougall (1963) had identified timeliness and proximity, as two determinants, among other aspects, of the news value of a story. These two determinants imply the relevance of the message pertaining to time and place, which help the readers to attend to the story and comprehend well.

Kamath (1969) also prescribed that the message in an agricultural article should be related to some problem or ambition of the reader and it should be properly timed. The message should be related to immediate future rewards, so as to attract readers' attention.

These remarks justify the prominence of message relevance as a variable to be studied in relation to reading comprehension and thus it was decided to include it in this study.

Simplicity of the message

After analysing the information collected from newspaper readers about their understanding of what they read, Griffin (1949) concluded that "probably not one half of the readers of professionally written newspaper stories finish reading with a sufficiently accurate comprehension of the subject matter".

Sorenson (1956) made a study on the knowledge and under-standing of soils by Wisconsin farmers and found that the topics of practical nature were understood by them to a great extent. They had a poor understanding of some of the theoretical or complex concepts such as plant food requirements, deficiency symptoms, soil acidity measurement etc., indicating that simplicity of the message is adding to better understanding and comprehension.

In a study on dairy farmers' knowledge of milk prices, Burnett and Clodius (1959) found that much of the information on milk checks received by farmers was not used or was beyond farmers' comprehension.

These reviews suggest that simplicity of the message might also be a contributing variable for increased comprehension. So, it would be worth to analyse its effects in this study also.

Completeness of the message

While discussing about writing agricultural articles for farm families, Hadley (1955) pointed out that a good story should contain all needed information on the topic and it should answer all natural questions that the farmers might ask. This sort of completeness would make a story more comprehendable and retainable. Kamath (1969) also stressed the same aspect while narrating the tips for writing feature stories on agricultural messages.

Duffy and Kabance (1982) stated that completeness was an important dimension for the usability of a text. Inadequacy of details would be a limiting factor for comprehension many times, they added.

These reviews indicate the importance of message completeness in reading comprehension and hence, it was decided to include it as an independent variable to test its effects on reading comprehension of agricultural articles by farmer readers.

Average sentence length

Many of the reasearchers who contributed to the studies on readability formulae have considered the average length of sentences in the article as an important aspect. Dolch (1948), while analysing the graded reading difficulty among school children, found that sentence length was a yardstick of assessing reading difficulty of text books.

Flesch (1948), developing his popular 'Reading Ease' formula as a revision of his original readability formula, considered the average sentence length as a major factor of reading ease of a printed matter. Even in the original readability formula also, he had taken this aspect into account for computing readability.

Establishing sentence length as an effective factor to be considered for improving the efficiency of the written

matter, Klare (1963) suggested that sentence length might influence the human memory span and thus become important.

While studying the effectiveness of communication through the Farm News Service of Kerala Agricultural University, Rajan (1982) developed a readability formula for Malayalam text, which considered the average sentence length in words to assess the readability of the articles.

Hartman (1984) found that mean text unit length was significantly correlated with the reading comprehension among ninth grade students.

In the background of these observations, the average sentence length was considered as an independent text variable to assess its influence on reading comprehension of agricultural articles by farmer readers.

Average word length

Like average sentence length, word length was also considered to be a significant factor in most of the readability studies. Dolch (1948) and Flesch (1948) have taken average word length into account in their 'reading difficulty' and 'reading ease' measurements respectively.

Klare (1963) has pointed out that word length was a crucial factor for assessing readability of a printed matter and it was measured in terms of number of syllables.

The average world length in terms of number of syllables per 100 words was considered by Rajan (1982) also when he developed a readability formula for agricultural articles in Malayalam language.

Being an important factor considered in readability studies, word length was taken as a text variable for this study also to test its possible influence on reading comprehension of agricultural articles by farmers.

2.5 Conceptual framework of the study

The rapid expansion of agricultural technology demands its effective diffusion among the intended clientele. To hasten this, various modes of communication are being used by the extension service, among which print media also have a vital role.

In the use of a printed communication with persuasive or instructional objectives, perception, understanding and interpretation of the meaning embodied is the major concern in assessing its utility (Tinker, 1965). These skills, resulting in the comprehension of the message, are strongly subjective and situational (Wainwright, 1972).

Reading comprehension is the important prerequisite in the reception of information from a print medium. Welford (1968) argued that there are two main aspects in the process of decoding input information.

"First, there is a problem of spatial
transpositions. These concern with
situations in which subjects have to
internally manipulate the spatial layout
of the stimulus, to match its lay out
with their own internal stored
representation, some comparison stimulus
or the layout of some set of controls.
The second major problem is that of
symbolic translation. Here, the subject
has to change the form of coding of the
imput, for example, to transform a set of
written instructions into an internal
spatial network".

In the context of reading comprehension, Rothkopf (1970)
identified a set of 'mathemagenic activities' for a written
instructional material. Mathemagenic activities are those
activities which give birth to learning, according to the
literal translation of the term coined by Rothkopf, which
include orientation (getting subjects into the instructional
situation), object acquisition (selecting and procuring
appropriate instructional objects), translation into internal
speech or representation, and the mental accompaniments of
reading (including discrimination, segmentation, processing
etc).

Another approach to the reading comprehension process
theory is through schematic knowledge structures. Rumelhart
and Ortony (1977) stated that schemata 'exist for generalised
concepts underlying objects; actions, situations, events,
sequences of events and sequences of actions". This implies
that schemata do not represent minute bits of information in
the reading material, but larger chunks of knowledge, which
may contain objects and sequences of actions pertaining to

those objects as well as attitudes and values that relate to them.

Anderson (1978) went further in this schema based theoretical propositions stating that comprehension of a message is placing a construction upon it that gives a coherent formulation of its contents. While analysing the possible effects of schemata on encoding and retriving the information in a printed matter, he suggested three major mechanisms that might form a schema-theoretic orientation. The first one, 'the retrieval plan hypothesis' as he called it, said that schema provided the structure for searching memory with the assumption of getting a mental pathway or implicit cue on certain information in the text.

Another possible explanation put forth by Anderson (1978) was that of 'output editing hypothesis'. It suggested that the schema contains within itself an index of importance of message cues, and the reader establishes a framework based jointly on this index, motivation and the situational demand characteristics.

The third possibility, as explained by Anderson (1978) was that of an 'inferential reconstruction'. It assumes that the reader tries to generate, recognise and verify the clues of the information, not directly from memory process, but through a reconstruction of concept elements already had in possession.

Frijda (1978) viewed the comprehension process of a printed matter from a different angle, and suggested that deep, rich memory representations are formed in the reader when the reading was treated as a problem-solving task. He underscored the transformational process in reading comprehension involving three disƒtinct phases such as ordering, integration and reconceptualization.

In ordering, according to Frijda (1978), the incoming sentence is understood by the reader with the formation of an internal representation of the information. Then macro-elements or units on the information are formed as reading process progresses. New elements are added by the new incoming sentences and then generalisations are made on similar or related units integrated.

Reconceptualization gives an internal representation of the message within the reader when he realizes the meaning of the entire corresponding passage. The author further indicated that ordering, integratioin and reconceptualization are supported by cognitive dispositions of the reader, mainly used in a problem-solving event. These processes are motivated by the knowledge-acquisition goals on the one hand, and by the focussing upon 'major events' and their detection on the other, he added.

For a printed material like agricultural article aimed at information transfer to and learning by the intended clientele in a social system, reading comprehension has to be

conceived as something more than symbolic translation or concept discrimination. In that context, reading comprehension can better be conceptualised to include three types of comprehension behaviour as given by Bloom (1956), such as translation, interpretation and extrapolation. Wilson et al. (1969) also highlighted these processes, originally suggested by Bloom (1956), as the integral components in reading comprehension process in a learning situation.

Translation here means giving meaning to various parts of the communication in the context in which the ideas appear (Bloom, 1956). The second type of comprehension behaviour, interpretation, involves reordering the ideas in a new configuration in the mind of the reader and identifying the relative importance of the ideas and their interrelationships by him. Extrapolation includes making estimates or predictions based on understanding of the trends implied in the message.

These three comprehension behaviours are normally assumed to occur in a sequence with translation in the lowest order and extrapolation in the highest order. In other words "accurate extrapolation requires that the reader be able to translate as well as interpret the communication, and in addition, he must be able to deduce the trends or tendencies beyond the given message, for which the reader has to be well aware of the limits within which the communication is posed as well as the limits within which it can be extended".

Thus, the comprehension of a printed farm message should enable the reader to extrapolate at least in his own situations.

This process of reading comprehension would always be influenced by a number of factors related to reader abilities as well as text structures (Tinker, 1965). As Della-Piana and Endo (1973) indicated, the influence of various factors on reading comprehension may vary according to the given siutation. Samuels (1983) broadly categoriesed various factors influencing reading comprehension, as external or 'outside-the-head' factors and internal or 'inside-the-head' factors. Whatever be the type of classification, a general assumption can be made, which is considered for this study, that there are several personal characteristics of the readers as well as characteristics of the text which exert considerable influence on the net reading comprehension of a printed matter. The available empirical evidences also support to derive such an assumption (Felstehausen, 1965; Crosiar, 1975; Zeier, 1977; Anderson, 1978; Calder, 1984; Hartman, 1984; Yochum, 1986).

The format of the story gives vivid reading experiences to the reader, particularly in feature articles. Some formats elucidate subjects imagination more than others. The observations by Hess (1985) also support this with the conclusion that reading comprehension was influenced by passage imagery in his study among school children.

The conceptual framework of this study assumes that the reading comprehension process of farmers involves three comprehension behaviours, namely translation, interpretation and extrapolation at varied levels and is influenced by several personal characteristics of farmer readers such as age, education, mass media exposure, general reading habit, reading habit of agricultural articles, social participation and background knowledge as well as text variables such as style of writing, interpretation of meaning, emphasis of ideas, relevance of the message, simplicity of the message, completeness of the message, average sentence length and average word length.

Based on the review of literature and conceptual frame- work, the following hypotheses were derived for this study:

1) There would be no variation in the levels of reading comprehension of agricultural articles in daily newspapers among the farmers.

2) There would be no significant relationship between the personal characteristics of the farmers and their reading comprehension of agricultural articles.

3) There would no significant influence of the text characteristics on the reading comprehension of agricultural articles by the farmers.

4)   There would be no significant difference between
      various formats of agricultural articles in terms
      of their reading comprehension.

PERSONAL
CHARACTERISTICS
OF READERS

TEXT
CHARACTERISTICS
OF ARTICLES

AGE

EDUCATION

MASS MEDIA
EXPOSURE

GENERAL
READING HABIT

READING HABIT OF
AGRICULTURAL
ARTICLES

SOCIAL
PARTICIPATION

BACK GROUND
KNOWLEDGE

READING
COMPREHENSION

STYLE OF
WRITING

INTERPRETATION
OF MEANING

EMPHASIS OF
IDEAS

RELEVANCE OF
THE MESSAGE

SIMPLICITY OF
THE MESSAGE

COMPLETENESS OF
THE MESSAGE

AVERAGE
SENTENCE LENGTH

AVERAGE
WORD LENGTH
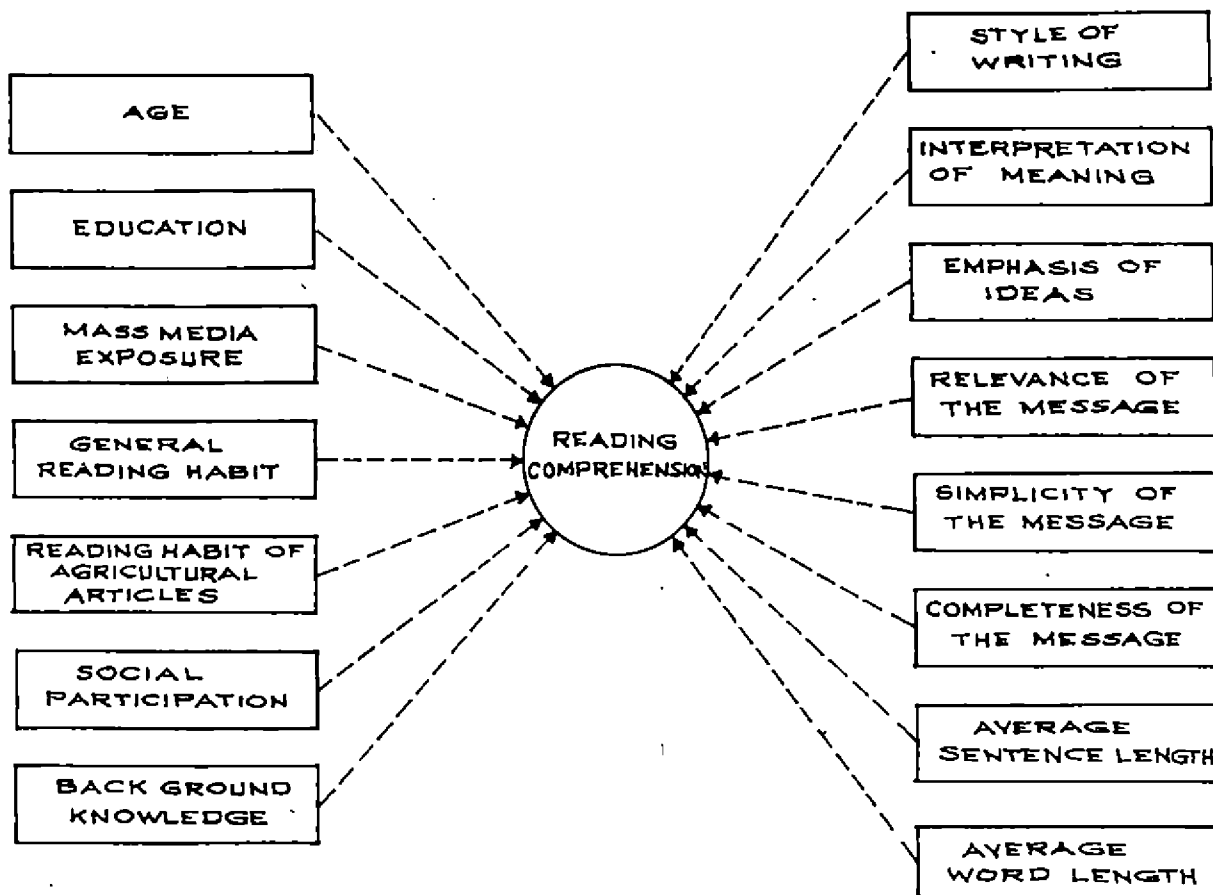
FIG. 1. CONCEPTUAL MODEL OF THE STUDY.

Methodology

III. METHODOLOGY

This chapter presents a general description of the methods and procedures followed in conducting the study, consisting of the research design, plan of the study, locale of the study, selection of respondents, operationalisation and measurement of variables, categorisation of respondents, techniques of data collection and statistical methods used.

3.1 Research design

This study, with the main objectives of measuring reading comprehension of agricultural articles in daily newspapers by farmers and the influence of personal characteristics as well as text variables on reading comprehension, was conducted adopting an expost- facto analytical approach. According to Kerlinger (1964), expost - facto research is a systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Here, the text variables may seem manipulable, but the articles used for measurement of reading comprehension were ultimately subjected to the discretion of the editorial desk of the newspaper and hence perfect control was not possible by the researcher. However, attempts were made to get maximum possible variability in text characteristics, by editing and modifying the articles in terms of the text variables, at the Publication Unit of the Kerala Agricultural University,

before handing over them to the newspaper office. Though the
stimulus was structured to some extent, it cannot be
classified as a typical experimental design for obvious
reasons.

3.2 Plan of the study

The study was conducted during the months of May-June
1988. Earlier it was felt necessary to identify the messages
that could suit an agricultural page of a newspaper in terms
of its readership needs. Hence, discussions were made
sufficiently in advance with the experts in Kerala Agricultu-
ral University, Kerala State Department of Agriculture and
some farmers in the nearby villages of the Kerala Agricultu-
ral University headquarters at Vellanikkara. Discussions were
also held with editorial staff of leading newspapers in
Malayalam publishing regular farm pages, to know their
message preference for that period. Considering the sugges-
tions of all the above and also the peculiar homestead
farming system prevailing throughout the state, wherein the
farmers try to cultivate the possible different crops in
small scale in their homesteads mainly to meet their home
needs, it was decided to use agricultural articles on various
aspects of vegetable cultivation, for measuring the reading
comprehension by the farmers. The time of the study (May-
June) was ideal for vegetable cultivation, as it was the time
of onset of South-West monsoon in Kerala. The above consul-
tations also led to a decision to have five formats for the

articles, which are commonly used in the farm pages of Malayalam dailies such as experience story, information feature, process story with one message, process story with more than one message and short-takes.

The researcher had detailed discussions with the Professor and Head, Department of Olericulture of the Kerala Agricultural University to get a clear idea on the messages to be used in various agricultural articles for this study. Then the researcher himself interviewed a successful and innovative farmer in vegetable cultivation and prepared an experience story on it. Three articles viz., an information feature, a process story (one message) and another process story (two messages) were prepared by various faculty members of the Department of Olericulture of the University. The Directorate of Extension of the University prepared a short-takes with four capsule messages based on the research findings and recommendations on vegetable cultivation. Altogether there were five articles in different formats.

The main contents of the articles were as follows:

Experience story

It was a success story of a progressive farmer, who used to cultivate all possible vegetables in his homestead of half-an-acre, with regular irrigation. Certain interesting points like growing vegetables without using plant protection chemicals, minimising chemical fertilizers, relay cropping to

save time and space etc, were included along with some rough estimate of his profits.

Information feature

A general information on vegetable cultivation, covering the best time of sowing, land preparation, seed procurement, plant protection etc were explained in this feature article.

Process story (one message)

It was a 'how-to-do' type article on the package of practices of chillies cultivation.

Process story (two messages)

It contained the package of practices of bitter gourd and snake gourd.

Short-takes

Four 'tips and bits' were given in this. This was given in a box and contained capsule messages on advantages of organic manure for cucumber and ash gourd, improved pumpkin seeds from Kerala Agricultural University, wilt resistant varieties of tomato and chillies and transplanting of chillies and brinjal.

All the leading newspapers in Malayalam which carry one full page of agricultural articles every week, were contacted to know the possibility of publishing all these five articles on the same day when the researcher wanted it. Considering

their opinions and convenience, 'Mathrubhumi', a leading Malayalam daily with second largest circulation and three editions, which started an agricultural column for the first time among all dailies in Malayalam in 1975, was selected to carry the five articles on vegetable cultivation. The articles were then handed over to the editorial office of Mathrubhumi for its further editing and lay out of the page. A request was made to publish these articles on 16th May, 1988, which was the proposed date for data collection from the farmer respondents'.

3.3. Locale of the study

Kerala has its peculiar homestead farming system, wherein the farmers try to grow different possible crops, including vegetables of their taste, mainly to meet the home requirements. During the South-West monsoon season of 1987, the State Department of Agriculture in Kerala launched an intensive vegetable production programme in two of its districts, namely Trivandrum and Trichur, with intensification of supplies of all necessary inputs and extension efforts. The main idea of this attempt was to produce maximum possible quantity of vegetables in the homesteads in these districts and to collect the surplus produce from all farmers for its sales through the State Civil Supplies Corporation shops at nominal prices so as to bring down the rising cost of vegetables. Encouraged by the good results from this programme, the State Department of Agriculture has decided to extend it to all other districts during the next year.

FIG. 2.

MAP OF KERALA

SHOWING THE LOCALE OF THE STUDY

KASARAGOD

CANNANORE

WYNAD

CALICUT

MALAPPURAM

PALGHAT

TRICHUR

ERNAKULAM

IDUKKI

KOTTAYAM

ALLEPPEY

PATHANAMTHITTA

QUILON

TRIVANDRUM

DISTRICT BOUNDARY

• DISTRICT HEAD QUARTERS

MAP OF INDIA

KERALA STATE
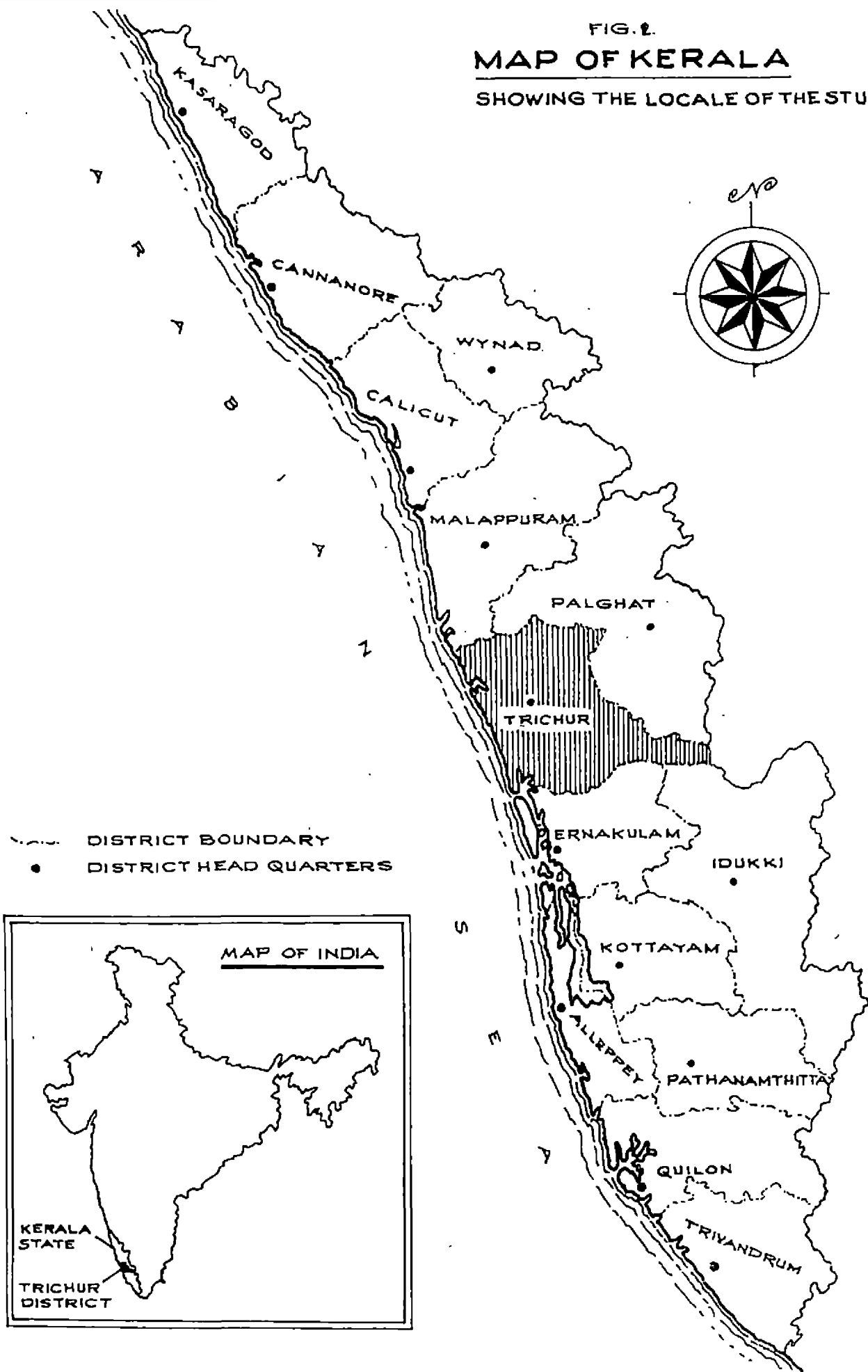
TRICHUR DISTRICT

In this background, Trichur district was selected for the conduct of this study for the following reasons.

1. Trichur was one of the two districts where the intensive vegetable production programme was launched in the previous year. The farmers in this district were supposed to have gained some level of awareness on vegetable cultivation through the intensive efforts of the State Department of Agriculture.

2. The Directorate of Extension of the Kerala Agricultural University and the College of Horticulture of the University with its separate Department of Olericulture are located in Trichur District. Efficient technical guidance, extension literature and quality seeds for all vegetables are being made available to the farmers through these two institutions.

3.4 Selection of respondents

There are 105 panchayaths (grass root level administration unit) in Trichur district, and the State Department of Agriculture has established its office, namely 'Krishi Bhavan', headed by one Agricultural Officer in each of these panchayaths. A decision was made to select respondents for this study from all the panchayaths in Trichur district. Hence, all the Agricultural Officers were addressed to suggest three names of farmers each with their full address, who were literates and could read agricultural articles in Malayalam daily newspapers.

Accordingly, a total number of 276 farmers were identified from the responses obtained from 92 Agricultural Officers in Trichur District. All these 276 farmers were, then, invited to the Directorate of Extension of the Kerala Agricultural University at Mannuthy where the University was planning to conduct a Workshop on farm columns in daily newspapers on 16th May, 1988. The University offered each of the farmer participants of the workshop, a free set of its publications in addition to the food and other facilities, as incentives.

The data on the reading comprehension had to be collected without much time lapse after reading of the articles by the farmers, in order to minimise the influence of the element of memory power from the comprehension measurement. Hence, the number of respondents was limited to the individuals who turned up and assembled after the invitation. A total number of 146 farmers, out of the 276 invited, came to the Directorate of Extension of the University. Out of this, six farmers could not give complete responses for the study as they had to leave early and the remaining 140 farmers constituted the sample of farmer readers for the study.

The text variables of the five articles used in this study were measured using another set of 40 respondents, who were experts in agricultural journalism and related fields. To select these respondents, an extensive list of 60 experts was prepared, from among professional journalists, faculty

members of Departments of Journalism of University of Kerala and University of Calicut, media men working in All India Radio and Doordarshan, regular freelance writers in agricultural columns of dailies, Farm Information Bureau of the Kerala State Department of Agriculture, staff of the State Institute of Languages. leaders of the Kerala Association for Non-Formal Education and Development (KANFED), Kerala Sasthra Sahithya Parishat and the faculty members of the Kerala Agricultural University. These experts, scattered all over the state, were contacted and considering their convenience, availability and willingness, forty of them were selected as the expert respondents for this study.

3.5 Measurement and operationalisation of variables

The conclusions derived from the review of previous studies pointed out the need to develop a measuring device for reading comprehension of agricultural articles, as the previous techniques seemed to be inadequate or invalid to measure the comprehension of agricultural articles in daily newspapers. Reading comprehension, being a level of achievement in reading process, had to be measured in terms of the extent to which it was gained out of the total potential. Hence, it was decided to develop an index that could measure the levels of reading comprehension of agricultural articles by the farmers.

3.5.1 Operationalisation and measurement of dependent

variable

Reading comprehension was conceived and operationalised in this study, following the lines expalined by Bloom (1956) as the total intellectual process within the individual while reading an article, so as to gain the meanings of the messages, their interrelationships and its applicability in his own situations. The process of reading comprehension was considered to include three types of comprehension behaviours such as translation, interpretation and extrapolation.

Items were prepared after reviewing the available literature on reading research, educational psychology and journalism. Before preparation of the preliminary set of items, the researcher had detailed consultations with the extension specialists of the Kerala Agricultural University, editors of six major dailies publishing agricultural columns, experts in non-formal education in Kerala, in addition to the experts in the University of Agricultural Sciences, Bangalore, on the feasibility of items to be included in the measuring index. On the basis of these discussions, a total number of 33 items were edited and listed in the preliminary scale, comprising 12 items under translation, 10 items under interpretation and 11 items under extrapolation.

This preliminary set of items was then given to a panel of 44 experts, drawn from among the faculty members of the Department of Agricultural Extension, faculty members of

Departments of Journalism and experts in adult education. They were requested to rate the relevance of each item to the respective sub-dimension of the variable under study on a three point continuum. They were also requested to modify the items and add or delete items, if necessary, to satisfy the criteria suggested by Guilford (1936), Kerlinger (1964) and Garret (1967).

Those criteria were:

- It should cover the universe of content;
- It should not contain any item which was not relevant to the variable in question; and
- There should not be any ambiguity in description of items.

Analysis of the responses from the judges indicated that only 16 items were relevant to measure the reading comprehension, after judging seven items as duplicative and 10 items as least relevant. The items which could obtain an agreement ratio of 0.8 or more to the maximum obtainable score were only selected to be included in the final reading comprehension index.

Reliability and validity

A good measuring instrument should evoke responses that are valid and nearly the same if administered twice to the same respondents (Goode and Hatt, 1952). Kerlinger (1964) suggested that reliability was the precision or accuracy of

the measurement device. In this study, reliability of this index was arrived at using the split-half method. Two sets of items, derived on half forms based on odd-even number, were administered to a set of 38 non-sample readers, along with a reading passage on agriculture. These two sets of scores were subjected to Pearson's product moment correlation and was corrected for the total length of the scale by using Spearman-Brown Prophecy formula as suggested by Downine and Heath (1965) and found (r_{tt} = 0.812) significant ensuring sufficient reliability of the instrument.

- Validity of the scale is the property that ensures the obtained test score as valid, only if it measured what it was supposed to measure. In this study, content validity was considered, wherein all the items were selected from a universe of content, as suggested by Guilford (1936), and rated for its high degree of relevance with an agreement ratio of 0.8 or more for each item.

The final format of the reading comprehension index is presented in Appendix II. The items to measure the level of reading comprehension were presented in open end question form and the responses were rated for their degree of correctness on a five point continuum. Since all the articles were on the messages of various aspects of vegetable cultivation, the scores ranging from one to five were assigned to the responses by assertaining the degree of correctness of each response based on the guidelines given by

the Professor and Head, Department of Olericulture of the Kerala Agricultural University.

The total score of the items under each sub-dimension such as translation, interpretation and extrapolation was found out separately and the grand total for all these three was also worked out. The indices for each sub-dimension and the total reading comprehension were arrived at using the formula:

$$\frac{\text{Obtained score}}{\text{Maximum obta-}} \times 100$$
Maximum obta-
inable score

These indices were worked out for each article separately and for all articles put together.

3.5.2 Measurement of independent variables

Based on the information from available literature and discussions with experts, scales were developed and used for the measurement of each independent variable in this study.

3.5.2.1 Personal characteristics

Age: It is operationalised as the number of years completed by the respondent at the time of investigation. Quantification was done by assigning a score of one to each year, which was rounded off to the nearest number.

Education: This indicates the level of formal education of the respondent, quantifying the different levels of education as follows:

Level	Score
Primary School (Upto 7th standard)	1
High School	2
Pre-degree	3
Graduate or equivalent	4
Post-graduate qualification	5

Mass media exposure: Mass media exposure was operationally defined in this study as the degree to which the individual respondent was exposed to various mass media communication. It was measured in terms of the frequency of his exposure to various mass media.

The following mass media were considered to assess the frequency of exposure of the respondents.

1   Newspaper

2   Radio

3   Television

4   Films

For each medium, scoring was made based on the frequency of exposure to the medium as follows:

Frequency	Score
Regularly	2
Occasionally	1
Never	0

Such scores for each medium were added together to get the mass media exposure score of the individual.

General reading habit

General reading habit was operationalised as the habit of the individual to read whatever printed materials available to him. This was measured by assessing the frequency of reading of four types of printed materials namely.

1   Newspaper

2   Magazines and other periodicals

3   Fictions and other books

4   All available leaflets, bit notices etc.

Scoring was done based on the frequency with which the individual reads such printed materials, as follows.

Frequency	Score
Regularly	2
Occasionally	1
Never	0

The scores obtained for each category of the printed material were added together to get the general reading habit score of the individual.

Reading habit of agricultural articles

Reading habit of agricultural articles was functionally defined as the habit of the individual to read the printed farm messages in the articles contained in any type of agricultural publication. This variable was measured by assessing the frequency with which the individual reads the agricultural articles in the following publications.

1   Farm pages in daily newspapers

2   Farm magazines and agricultural columns in other periodicals

3   Leaflets and other such printouts on agriculture

Scoring was done based on the frequency of reading of all these publications, as follows:

Frequency	Score
Regularly	2
Occasionally	1
Never	0

The sum of the scores obtained for all the three categories of agricutural publications indicated the score for reading habit of agricultural articles by the individuals.

Social participation

Social participation was operationalised in this study as the extent of involvement of an individual in any formal organisation in his community. This was measured in terms of the membership of the individual in the organisations as well

as his frequency of participation in its activities. The scoring pattern of this variable was done as follows.

i) Membership or official position in organisations
   (Such as social, political, cultural organisations, co-operative societies, trade, unions, recreation clubs etc)

                                                                    Score

Member and office bearer in more than one organisation   4

Member and office bearer in one organisation   3

Member in more than one organisation   2

Member in one organisation   1

Not a member in any organization   0

ii) Frequency of participation in the activities

                                                                    Score
Participates in all meetings and other activities
regularly   2

Participates occasionally in meetings and other activities   1

Does not participate in meetings or other activities   0

The scores of (i) and (ii) were added to get the score of social participation of a respondent.

Background knowledge

For the purpose of this study background knowledge was operationalised as the knowledge status of the respondent in the cultivation of vegetables, in terms of his farming status, experience in vegetable cultivation and information acquisition on vegetable cultivation. This variable was measured as follows.

a. Farming status

	Score
. Full time engaged in farming	2
Farming is only a subsidiary occupation	1

b. Experience in vegetable cultivation

	Score
Cultivates vegetables regularly	3
Cultivates vegetables for the last one year	2
Cultivates vegetables since last season	1

c. Apart from experience in cultivation, knowledge on

   the crops dealt in the articles is acquired through

	Score
Seeing cultivation of those vegetables by others	1
Reading literature on cultivation of those vegetables	1
Listening on cultivation of those vegetables from others	1
Does not have any knowledge on those vegetables	0

The scores of (a), (b) and (c) were added together to get the score of background knowledge of a respondent.

3.5.2.2 Text variables

A set of score cards were developed to measure the selected text variables of agricultural articles except average sentence length and average word length, with the help of judges opinion. For this, initially with respect to

each score card, maximum possible number of items which depict the assessment of the variable were collected from available literature and informal discussions with experts in the field of agricultural journalism.All those items were put together to form the preliminary score card for each text variable.

These preliminary score cards were then supplied to a panel of 26 experts drawn from among professional journalists, faculty members in the journalism departments of the Universities in Kerala, media men in All India Radio and Doordarshan and faculty members of the Department of Agricultural Extension, who acted as judges, for rating the degree of relevance of each item contained in each score card on a three point continuum. These judges were requested to rate the items, against certain criteria as suggested by Guifford (1936), and Kerlinger (1964) and Garret (1967) to ensure its content validity. Those criteria were:

- The score card covers the universe of content,
- It does not contain any item which is not relevant to the variable in question, and
- It has no ambiguity in the description of items.

The judges were also requested to add or delete items if necessary or to modify the items to suit the requirements of the variable assessment.

After getting the judges responses, items were selected based on the ratio of the total score obtained for each item,

as against the maximum obtainable score. Those items which could obtain a ratio of 0.8 or more were selected to be included in the score card.

Style of writing

The style of writing was operationalised as the way in which the article was written to ensure maximum clarity, brevity and colour for easiness and efficiency in reading. This variable was measured in terms of three sub-dimensions such as clarity, brevity and colour. The following items were included to depict the sub-dimensions of this qualitative variable.

a. Clarity

1. All the message units can be explained in only one way (No chance of misinterpreting).

2. All the words and sentences in the article carry only one meaning each.

3. The words used are the simplest ones that can be used to carry the intended meaning.

4. Each sentence in the article is a simple sentence, carrying only one idea each.

b. Brevity -

1. The article contains minimum words in each sentence

2. The article is written with minimum possible number of sentences to contain the message.

3. There is no unnecessary lagging in any part of the article

4.   There is no unwanted narration in any part of the article

c) Colour (Variety)

1.   The length of paragraphs vary in the article

2.   Sentence structure and length also vary in the article

3.   It contains varied usages and phrases

4.   Varied examples and illustrations are used

5.   Quotations and statements are also used to give colour

6.   'Posing questions and answering them' is also used to add colour

Each of these items were quantified using a three point continuum as follows:

Rating	Score
Very much true in the case of this article	2
True to some extent in the case of this article	1
Not at all true in the case of this article	0

The score of all 14 items were added together to get the score for style of writing of one article by a respondent.

Interpretation of meaning

Interpretation of meaning was functionally defined as the extent to which the technical subject matter was interpreted so as to make it maximum comprehendable for the intended readers.   Two items were considered to measure the interpretation of meaning in an article, as follows.

1. The technical subject matter is interpreted at adequate length

2. The interpretation is made using the readers' familiar words and examples.

Here also the scores were assigned based on the applicability of the item to the article, as follows.

Rating	Score
Very much true in the case of this article	2
True to some extent in the case of this article	1
Not at all true in the case of this article	0

The scores of the two items were added together to get the score for interpretation of meaning of each article.

Emphasis of ideas

It was operationalised as the extent to which the items in the article are properly emphasised to highlight them in the text for easy comprehension. There were four items in the score card to assess this variable, as follows:

1. The main theme in the article is emphasised in the introduction.

2. All message units are properly emphasised in separate paragraphs.

3. The important messages are emphasised by writing style.

4. Some important messages are emphasised by using different letter types for printing.

The scoring for each item was done based on its applicability to the article as in the previous cases.

Rating	Score
Very much true in the case of this article	2
True to some extent in the case of this article	1
Not at all true in the case of this article	0

The scores obtained for all the four items were added together to get the score for the variable for each article.

Relevance of the message

This variable was defined in terms of the relevance of the message contained in the article to some or other life situation of the readers. The score card to measure the relevance of the message contained five items as follows:

1. Relevant to the season.

2. Relevant to the farming situation.

3. Relevant to the policies/programmes of the government

4. Relevant to the consumption/market demands.

5. Relevant to the general information needs of the readers

Here also, the scoring was done based on the applicability of each item to the article, as given below.

Rating	Score
Very much true in the case of this article	2
True to some extent in the case of this article	1
Not at all true in the case of this article	0

Total score of all the five items was found out to get the score for relevance of the message of each article.

Simplicity of the message

Simplicity of the message as a variable was functionally defined as the extent to which the reader might perceive the message contained in the article as simple to follow. Its measurement was done on a three point continuum as described below:

Rating	Score
The message contained in the article is very simple	3
The message contained in the article is somewhat simple	2
The message contained in the article is not so simple	1

The score of the adjective which was chosen by the respondent was considered to be the score for that article by that respondent.

Completeness of the message

It was operationally defined as the extent to which the message fulfils the information needs of the reader, by giving necessary background details and clarifying all natural doubts. The score card contained two items such as,

1. The article gives all background details for the benefit of a new reader who is blank on the topic.

2. All the natural doubts of the reader are answered in the article.

Scores were assigned to each item based on its applicability to the article as indicated below.

Rating	Score
Very much true in the case of this article	2
True to some extent in the case of this article	1
Not at all true in the case of this article	0

Scores of both the items were added together to get the score for the variable.

Average sentence length

Average sentence length, being a physical characteristic or quantitative was defined and measured in terms of average number of words in a sentence in the article. To measure this, total number of words and total number of sentences in the article were counted and the average number of words in one sentence was calculated, as suggested by Flesch (1948).

Average word length

Average word length was operationalised and measured in this study as the total number of syllables per 100 words, as suggested by Flesch (1948). The score was arrived at after counting total number of syllables in the article and total number of words, and then calculating number of syllables per 100 words.

In the case of the text variables, except average sentence length and average word length, mean scores were worked out for each variable for every article from the total score obtained for the sample of 40 respondents. Average sentence length and average word length were calculated for every article by the researcher himself, as they were physical characteristics attached to each article.

3.6 Categorisation of respondents

The respondents were categorised into high, medium and low with respect to the dependent variable and personal characteristics based on the following criteria.

High : Above (mean + 1 S.D)

Medium : Between (mean, ±1S.D)

Low : Below (mean - 1 S.D)

3.7 Techniques of data collection

The data for this study were collected at two phases from two sets of respondents viz. the farmer readers and the expert respondents. To collect data from the farmer respondents, two types of questionnaires were prepared, one containing questions related to the measurement of personal characteristics and the other containing the questions of the reading comprehension measurement index. These two questionnaires were translated to Malayalam language and got neatly printed with sufficient space between each question, so as to reduce the strain in reading and answering them.

All the five articles on vegetable cultivation were published in Mathrubhumi in one page, on the proposed day (16th May, 1988). When the farmer respondents assembled at the Directorate of Extension of the Kerala Agricultural University at 9 a.m. on that day for registration of their names to attend the workshop conducted by the University, one copy each of the newspaper carrying the articles was distributed to them and requested to read all the five articles. In addition, one copy of the questionnaire containing measurement of personal characteristics was also given to each respondent and requested to fill up the same. Sufficient time was given to the respondents to fill up the questionnaire and read the articles, since the workshop started only at 10.30 a.m.

After the inaugural session of one hour, the entire forenoon session was spared for collection of data on reading comprehension. Five sets of questionnaire, containing the reading comprehension measurement index, one for each article, were given to each respondent and requested to fill up with their answers carefully. Whenever they raised doubts, detailed clarifications were made so as to ensure the real responses for measuring the level of reading comprehension. Care was taken to obtain some response with respect to each of the items in all the questionnaires. As and when they completed this exercise, those five questionnaires on reading comprehension were collected back

along with the filled up questionnaire on personal
characteristics from each respondent.

The second phase of data collection was to get the
articles rated for its text variables by a set of 40 expert
respondents from all over the State. The researcher met each
of them in person and explained and handed over five sets of
score cards, one each to rate the text variables of each
article, along with one copy of the newspaper carrying the
articles. After giving two or three days time, each of them
was met again and the filled up score cards were collected
back.

3.8 Statistical methods used

Data collected from the farmer readers and expert
respondents were coded, tabulated and analysed using the
following statistical methods.

Person's product moment correlation

This coefficient was used to study the nature and degree
of relationship between each of the personal characteristics
of the respondents and the dependent variable. Analyses were
also made between the personal characteristics and each sub-
dimension of reading comprehension, namely translation,
interpretation and extrapolation. The computed value of r
was tested for its significance using the table value at n-2
degrees of freedom.

Multiple regression

It was used to determine the joint influence of the selected personal characteristics on the dependent variable, and its sub-dimensions.

Multiple correlation (R) and the coefficient of determination

These were worked out to detect the percentage of variation of dependent variable and its sub-dimensions explained by the personal characteristics. They were also tested for the significance.

Multivariate path coefficient analysis

Path analysis originally developed by Wright (1921) followed by Li (1955), Land (1969) and Singh and Chawdhary (1979) was made use of to know the nature of influence with direct or indirect effect of the personal characteristics exerted on the dependent variable in the prediction model.

Pages L (trend) test

To identify the influence of the text variables on reading comprehension of agricultural articles by the respondents, Pages L (trend) test was applied, as suggested by Meddis (1975). This test suggested whether the means of text variables could be ordered to form a trend, considering the total of the ranks obtained for each story from the reading comprehension indices of individual respondents.

Analysis of variance

Two-way analysis of variance (ANOVA) was used to know whether there was any significant difference in the levels of reading comprehension among the agricultural articles in different formats.

Taking into consideration that the data were at least at ordinal level and distribution was with considerable degree of homogenity of variance, some parametric methods were preferred and used as per the suggestions of Boneau (1960) and McNemar (1962).

Results

IV. RESULTS

This chapter deals with the results obtained in this study. Keeping the objectives in view, the findings are presented in the following sequence.

1. The distribution of respondents based on their personal characteristics.

2. Levels of reading comprehension of the agricultural articles by the respondents.

3. Relationship of selected characteristics of the respondents with their reading comprehension.

4. Influence of text variables on the reading comprehension of agricultural articles by the respondents.

5. Identification of the variation of agricultural articles in terms of their reading comprehension among the formats used in this study.

4.1 Distribution of respondents based on their personal characteristics

An attempt was made to know the distribution of the respondents with respect to the selected personal characteristics, and the results are presented in Table 1.

It was revealed that, as expected, more than fifty per cent of the respondents were distributed in the medium category with respect to all the selected personal

Table 1:   Distribution of respondents based on their personal
           characteristics

(n=140)

Var. No.	Personal Characteristic	Category	Range	No.	Per cent
X_1	Age	High	53-68	23	16.43
		Medium	30-52	84	60.00
		Low	21-29	33	23.57
X_2	Education	High	4-5	30	21.43
		Medium	2-3	73	52.14
		Low	1	37	26.43
X_3	Mass media exposure	High	7-8	22	15.71
		Medium	4-6	100	71.43
		Low	2-3	18	12.86
X_4	General reading habit	High	7-8	30	21.43
		Medium	5-6	67	47.86
		Low	3-4	43	30.71
X_5	Reading habit of agricultural articles	High	6	6	4.29
		Medium	3-5	108	77.14
		Low	2	26	18.57
X_6	Social participation	High	6	30	21.43
		Medium	3-5	84	60.00
		Low	1-2	26	18.57
X_7	Background knowledge	High	6	52	37.14
		Medium	5	60	42.86
		Low	3-4	28	20.00

characteristics, except in the case of general reading habit and background knowledge. However, in the case of reading habit of agricultural articles and mass media exposure, accumulation of the respondents in the medium category was very high.

4.2 Levels of reading comprehension of agricultural articles by the respondents

. The data regarding the levels of reading comprehension of agricultural articles by the farmer respondents are presented in Table 2.

A perusal of this Table revealed that the respondents varied to a considerable extent in their levels of reading comprehension (37.25 to 67.50). On further classification of these respondents into high, medium and low, it was found that nearly sixty per cent of the respondents belonged to the medium level of reading comprehension, whereas the rest were distributed more or less evenly into high and low categories. It is important to note that the respondents could reach only to a maximum level of 67.50 in the reading comprehension of agricultural articles they read, eventhough theoretically they could have reached upto 100.

Table 2: Distribution of respondents based on their levels of
reading comprehension agricultural articles

(n=140)

Sl.No.	Category	Range *	Number	Per cent
1	High	61.89 - 67.50	28	20.00
2	Medium	47.64 - 61.88	83	59.29
3	Low	37.25 - 47.63	29	20.71

* Total potential range = 20-100

4.3 Relationship of reading comprehension of the respondents with selected personal characteristics

The results on the relationship of reading comprehension with the selected personal characteristics of the respondents are displayed in Table 3.

It was indicated that all the selected personal characteristics, except the background knowledge were significantly related at 0.01 level of probability with the reading comprehnsion of the respondents. Two variables such as age and social participation showed an inverse relationship with reading comprehension, whereas other four variables namely education, mass media exposure, general reading habit and reading habit of agricultural articles exhibited a positive correlation. The degree of relationship was maximum in the case of general reading habit ($r = 0.753$), closely followed by reading habit of agricultural articles ($r = 0.703$). The correlations in the case of other personal characteristics were found to be low.

Multiple regression analysis

The evidences by correlation coefficients showed that each of the personal characteristics had some effect on the reading comprehension by the respondents. The relationships were expressed in terms of simple correlation coefficients. However, it should be considered that reading comprehension was not fully influenced by any one of these factors selected in isolation, but by all of them as a part of an

Table 3: Relationship between the reading comprehension of the respondents and their personal characteristics

(n=140)

Var. No.	Characteristic	Correlation coefficient (r)
X_1	Age	-0.268 **
X_2	Education	0.371 **
X_3	Mass media exposure	0.304 **
X_4	General reading habit	0.753 **
X_5	Reading habit of agricultural articles	0.703 **
X_6	Social participation	-0.268 **
X_7	Background knowledge	-0.075

** Significant at 0.01 level

interdependent system with reciprocal· and interactive
relationships. Hence, the joint influence of all the
selected personal characteristics on the reading
comprehension was determined through the multiple regression
analysis and the results are given in Table.4

The data revealed that only two out of the seven
selected personal characteristics, namely, general reading
habit and reading habit of agricultural articles · were
significant in explaining the variation in reading
comprehension of agricultural articles by the respondents.
The coefficient of determination (R^2) was found to·be 0.6079.
This indicated that the variation in reading comprehension to
the extent of 60.79 per cent was explained by the presence·of
all the seven variables put together. This coefficient of
determination was found to be significant at 0.01 level of
probablity.

Path analysis

The simple correlation coefficients indicated the degree
and nature of relationship of each personal characteristic
with reading comprehension ignoring the possible influence of
other personal characteristics, while multiple regression
revelaed the joint influence of all the selected personal
characteristics on reading comprehension. · It could be of
interest to split the amount of relationship that a
particular characteristic had with the reading comprehension
into (1) its direct influence on the reading comprehension

Table 4: Multiple regression analysis of personal character-
istics of respondents with reading comprehension of
agricultural articles.

(n=140)

Var. No.	Characteristic	Regression coefficient	t value	F
X_1	Age	-0.535	-1.367	
X_2	Education	-0.1082	-0.211	
X_3	Mass media exposure	0.0342	0.082	
X_4	General reading habit	2.7174**	5.305	29.235**
X_5	Reading habit of agricul- tural articles	1.7214**	3.184	
X_6	Social participation	-0.0836	-0.282	
X_7	Background knowledge	-0.0531	-0.111	

R^2 = 0.6079   ** Significant at 0.01 level

and (2) the possible indirect effect on the reading comprehension through the influence of the other personal characteristics. Since this information was not available in the earlier analyses, the data were subjected to the multivariate path analysis in order to get the desired information. This path analysis would enable one to measure direct and indirect effects of each personal characteristic on reading comprehension separately and the results are presented in Table 5.

It was interesting to note that general reading habit had the highest direct effect on reading comprehension, followed by reading habit of agricultural articles. The remaining variables such as age, education, mass media exposure and social participation had comparatively smaller direct effects on reading comprehension. The Table further revealed that reading habit of agricultural articles and education possessed highest total indirect effects in that order.

The data again explained that all the selected personal characteristics had largest indirect effect through general reading habit, whereas general reading habit itself was found to have the largest indirect effect through reading habit of agricultural articles, as depicted in Fig.3.

Table 5: Path analysis of the personal characteristics of the respondents with their reading comprehension

(n = 140)

Var. No.	Characteristic	Direct effect		Total in-direct effect		Largest in-direct effect	
		Effect	Rank	Effect	Rank	Effect	Through variable No.
X_1	Age	-0.085	III	-0.183	VI	-0.130	X_4
X_2	Education	-0.017	IV	0.388	II	0.245	X_4
X_3	Mass media exposure	0.006	V	0.297	III	0.199	X_4
X_4	General reading habit	0.506	I	0.246	IV	0.227	X_5
X_5	Reading habit of Agricultural articles	0.290	II	0.413	I	0.396	X_4
X_6	Social participation	-0.017	IV	-0.251	V	-0.126	X_4

FIG.3. PATH DIAGRAM SHOWING DIRECT AND INDIRECT EFFECT OF SELECTED PERSONAL CHARACTERISTICS OF FARMERS ON THEIR READING COMPREHENSION OF AGRICULTURAL ARTICLES.
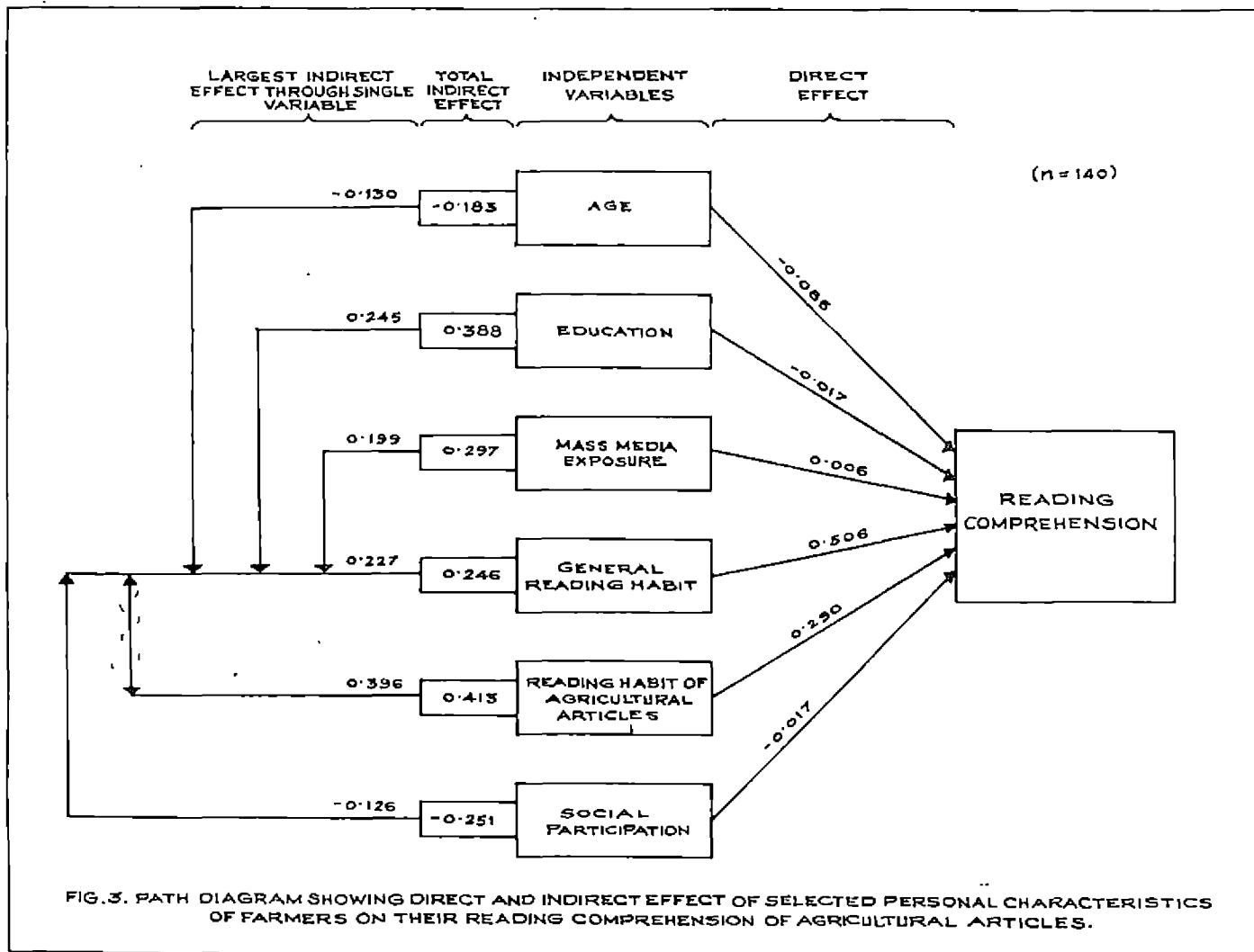
Relationship of translation, interpretation and extrapolation behaviours by the respondents with their personal characteristics

The three sub-dimensions of reading comprehension namely translation, interpretation and extrapolation were further analysed to know their relationships with the selected personal characteristics and the results are displayed in Table 6.

It was evident from these results that four variables such as education, mass media exposure, general reading habit and reading habit of agricultural articles were positively and significantly correlated with all the three sub-dimensions of reading comprehension. It was also noted that the extent of relationship of each of these personal characteristics was found to be more or less the same in all the three cases namely translation, interpretation and extrapolation, indicating that these three had similar influence by these four personal characteristics.

It was found that age exhibited negative and significant relationship with translation behaviour and extrapolation behabviour, whereas social participation had a negative and significant relationship with translation and interpretation behaviours.

Table 6: Relationship of translation, interpretation and extra-
polation behaviour of the respondents with their
personal characteristics

(n = 140)

Var. No.	Characteristic	Translation (r_1)	Interpretation (r_2)	Extrapolation (r_3)
X_1	Age	-0.176*	-0.111	-0.219**
X_2	Education	0.298**	0.397**	0.328**
X_3	Mass media exposure	0.228**	0.259**	0.304**
X_4	General reading habit	0.627**	0.684**	0.694**
X_5	Reading habit of agricultural articles	0.628**	0.652**	0.591**
X_6	Social participation	-0.275**	-0.279**	-0.158
X_7	Background knowledge	-0.089	-0.125	-0.001

* Significant at 0.05 level

** Significant at 0.01 level

Multiple regression analysis

The results of multiple regression analysis of the selected personal characteristics with the three comprehension behaviours are provided in Table 7.

These results also revealed same trend in explaining the variation, bringing out general reading habit as a significant factor in all the three comprehension behaviours. Reading habit of agricultural articles was significant in the case of translation and interpretation behaviours only. The coefficients of determination (R^2) were significant at 0.01 level of probability in all the three cases, explaining 44.83 per cent variation $(R^2 = 0.4483)$ in the case of translation, 52.94 per cent variation $(R^2 = 0.5294)$ in the case of interpretation and 50.21 per cent variation $(R^2 = 0.5021)$ in the case of extrapolation, in the presence of all the selected personal characteristics put together.

Path analysis

Separate path analyses were carried out to know the direct and indirect effects of each of the selected personal characteristics on translation, interpretation and extrapolation behaviours and the results are given in Table 8,9 and 10.

Table 7: Multiple regression analysis of personal characteristics of respondents with their translation, interpretation and extrapolation in the reading comprehension of agricultural articles

(n = 140)

Var. No.	Characteristic	Translation		Interpretation		Extrapolation	
		Reg. Coeff.	t value	Reg. Coeff.	t value	Reg. Coeff.	t value
X_1	Age	-0.0028	-0.043	0.1216	1.731	-0.0578	-0.949
X_2	Education	0.1238	0.145	1.5697	1.708	-0.6839	-0.858
X_3	Mass media exposure	0.2441	-0.352	-0.7356	-0.981	0.6535	1.005
X_4	General reading habit	2.6712**	3.139	3.8003**	4.136	4.3839**	5.502
X_5	Reading habit of agricultural articles	2.7027**	3.009	2.5919**	2.673	1.1707	1.392
X_6	Social participation	-0.5280	-1.071	-0.7746	-1.456	0.3573	0.774
X_7	Background Knowledge	-0.4202	-0.528	-1.0345	-1.205	-0.8525	1.145
	F	15.325**		21.215**		19.017**	
	R^2	0.4483		0.5294		0.5021	

In the case of translation behaviour, maximum direct effect was recorded by general reading habit, closely followed by reading habit of agricultural articles, leaving other variables with very little direct effect (Table 8). Total indirect effect was highest through reading habit of agricultural articles, followed by education. Four variables such as age, education, mass media exposure and reading habit of agricultural articles had their largest indirect effect through general reading habit, while social participation had its largest indirect effect through reading habit of agricultural articles.

The data in Table 9 showed that general reading habit, followed by reading habit of agricultural articles had maximum direct effect on interpretation behaviour also. For total indirect effect, reading habit of agricultural articles and mass media exposure ranked first and second respectively. All the four variables namely education, mass media exposure, reading habit of agricultural articles and social participation had their largest indirect effect through general reading habit.

In the case of extrapolation behaviour also, general reading habit emerged as top, followed by reading habit of agricultural articles, in exerting direct effect (Table 10). Total indirect effect was highest through reading habit of agricultural articles and then through education. Again, four variables viz., age, education, mass media exposure and

Table 8: Path analysis of the personal characteristics of the respondent with their translation behaviour

(n = 140)

Var. No.	Characteristic	Direct effect		Total in-direct effect		Largest In-direct effect	
		Effect	Rank	Effect	Rank	Effect	Through variable No.
X_1	Age	-0.003	VI	-0.172	VI	-0.091	X_4
X_2	Education	0.014	V	0.283	II	0.172	X_4
X_3	Mass media exposure	-0.032	IV	0.256	IV	0.140	X_4
X_4	General reading habit	0.355	I	0.269	III	0.254	X_5
X_5	Reading habit of agricultural article	0.325	II	0.301	I	0.278	X_4
X_6	Social participation	-0.078	III	-0.194	V	-0.109	X_5

FIG.4. PATH DIAGRAM SHOWING DIRECT AND INDIRECT EFFECT OF SELECTED PERSONAL CHARACTERISTIC OF FARMERS ON THEIR TRANSLATION BEHAVIOUR.
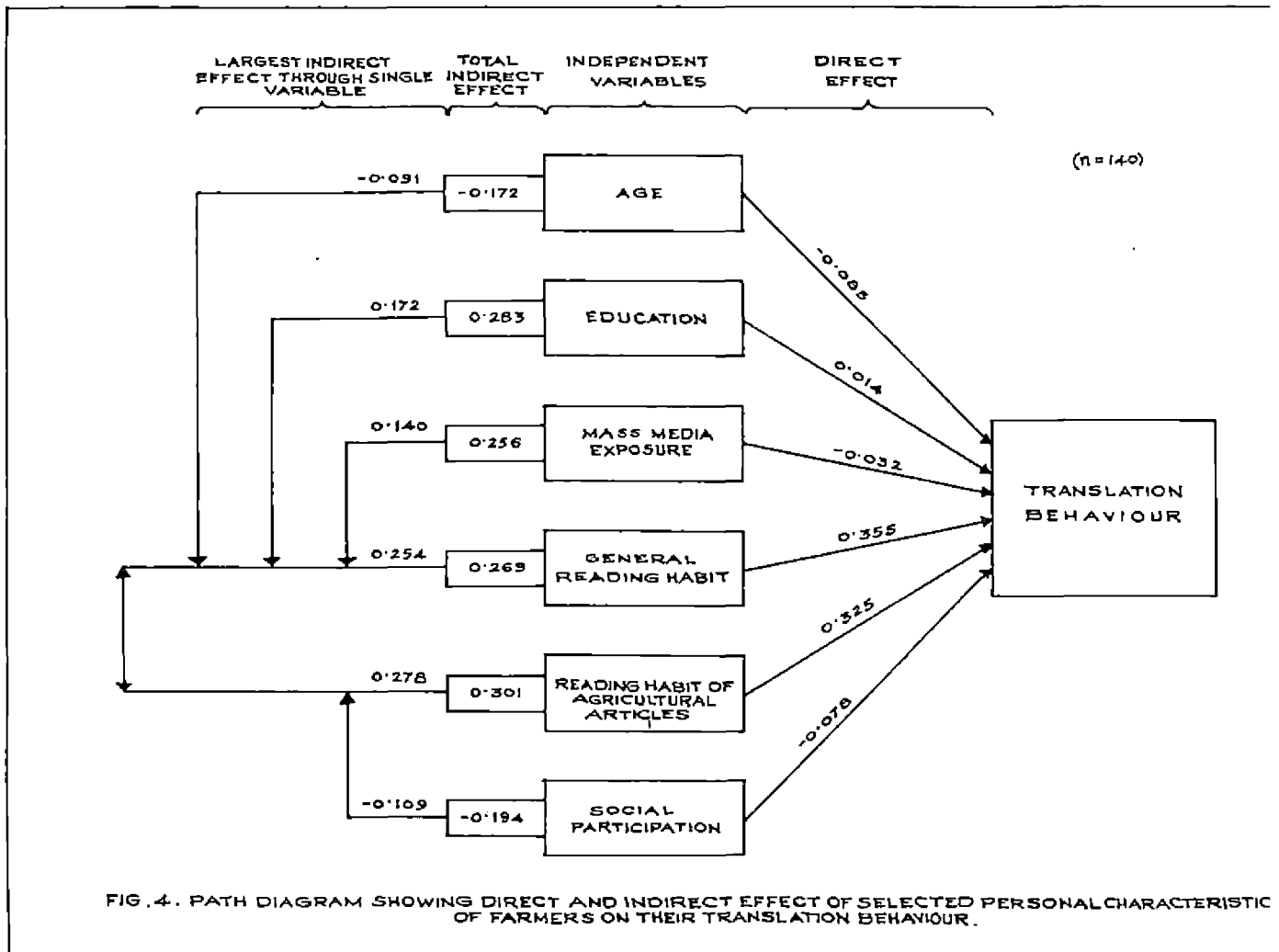
Table 9: Path analysis of the personal characteristics of the respondent with their interpretation behaviour

(n=140)

Var. No.	Characteristic	Direct effect		Total in-direct effect		Largest In-direct effect	
		Effect	Rank	Effect	Rank	Effect	Through variable No.
X_2	Education	0.155	III	0.268	IV	0.209	X_4
X_3	Mass media exposure	-0.083	V	0.371	II	0.170	X_4
X_4	General reading habit	0.432	I	0.275	III	0.209	X_5
X_5	Reading habit of agricultural article	0.266	II	0.399	I	0.338	X_4
X_6	Social participation	-0.098	IV	-0.217	V	-0.108	X_4

FIG. 5. PATH DIAGRAM SHOWING DIRECT AND INDIRECT EFFECT OF SELECTED PERSONAL CHARACTERISTICS OF FARMERS ON THEIR INTERPRETATION BEHAVIOUR.
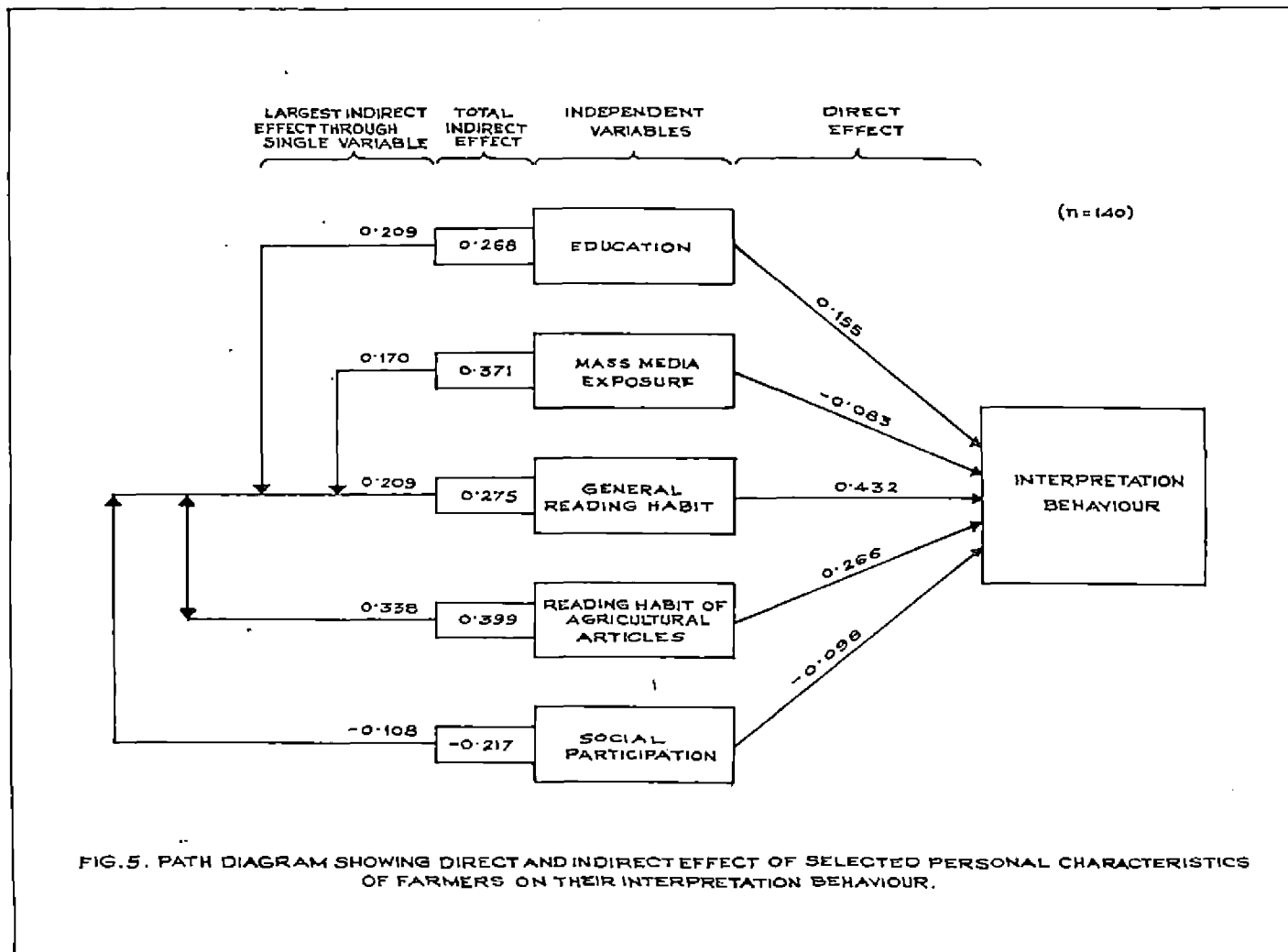
Table 10: Path analysis of the personal characteristics of the responder
with their extrapolation behaviour

(n = 140)

Var. No.	Characteristic	Direct effect		Total in-direct effect		Largest In-direct effect	
		Effect	Rank	Effect	Rank	Effect	Through variabl No.
X_1	Age	0.067	V	-0.175	V	-0.152	X_4
X_2	Education	-0.080	IV	0.423	II	0.286	X_4
X_3	Mass media exposure	0.088	III	0.238	III	0.233	X_4
X_4	General reading habit	0.591	I	0.125	IV	0.112	X_5
X_5	Reading habit of agricultural article	0.143	II	0.471	I	0.463	X_4
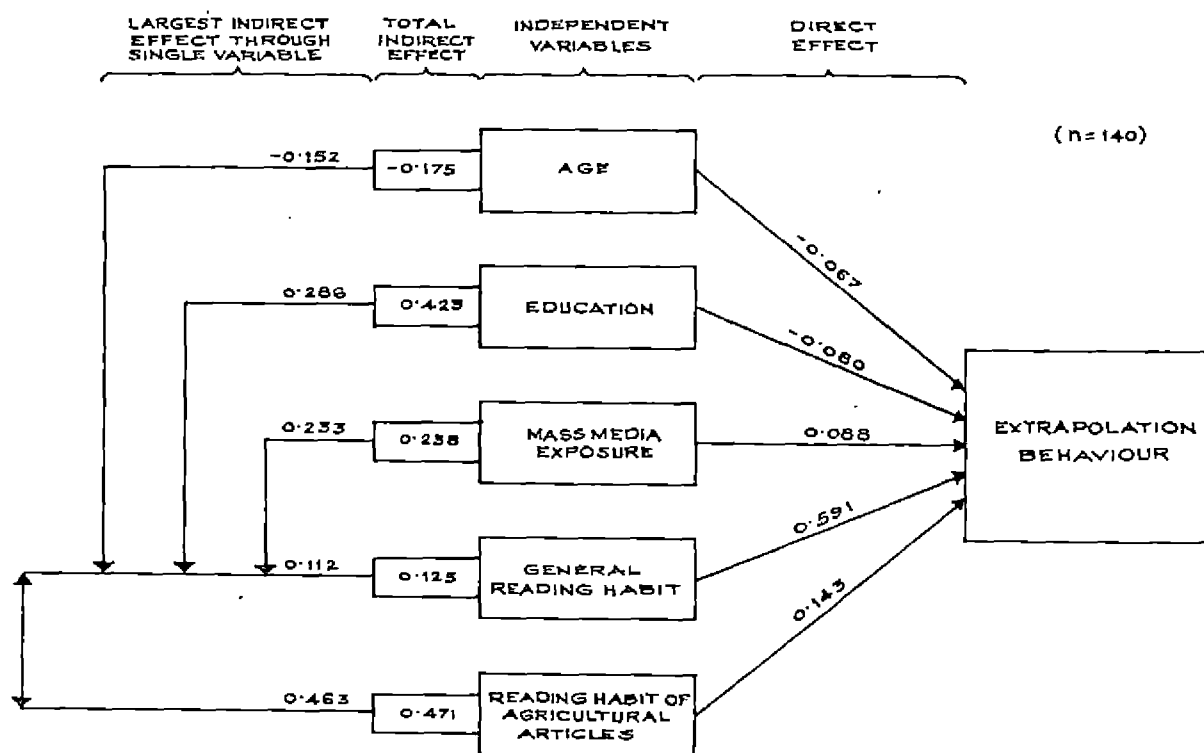
FIG. 6. PATH DIAGRAM SHOWING DIRECT AND INDIRECT EFFECT OF SELECTED PERSONAL CHARACTERISTICS OF FARMERS ON THEIR EXTRAPOLATION BEHAVIOUR.

reading habit of agricultural articles had their largest indirect effect through general reading habit.

4.4 Relationship of text variables with the reading comprehension of agricultural articles by the respondents

The relationships of text variables with the reading comprehension of agricultural articles were found out by applying Pages ·L (trend) test, which elicits the information on the influence exerted by a set of rankable categories on a set of rankable scores. In this test, the significantly large values of L suggest that the means are ordered to form a trend.

Influence of style of writing on reading comprehension

The data on the influence of style of writing on reading comprehension are displayed in Table.11.

It was indicated that the Z value was positive and significant at 0.01 level of probability, which implied the significant influence of style of writing on reading comprehension of agricultural articles. This suggested that a better style of writing would help a better comprehension of the agricultural articles.

Influence of interpretation of meaning on reading comprehension

The results on the influence of interpretation of meaning on reading comprehension are provided in Table 12.

Table 11: Influence of style of writing on reading comprehension o|
agricultural articles by the respondents -

Sl. No.	Story	Mean score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	20.000	5	700.0		
2.	Information feature	15.975	4	434.5		
3.	Process story (one message)	15.950	3	416.5	7431.5	19.125£
4.	Process story (two messages)	15.150	2	398.0		
5.	Short takes	12.475	1	148.0		

** Significant at 0.01 level

Table 12: Influence of interpretation of meaning on reading comprehensi
of agricultural articles by the respondents

Sl. No.	Story	Mean score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	3.350	5	700.0		
2.	Information feature	2.250	3	434.5		
3.	Process story (one message)	2.175	2	416.5	7376.5	18.196*
4.	Process story (two messages)	2.325	4	398.0		
5.	Short takes	1.725	1	148.0		

** Significant at 0.01 level

The positive and highly significant Z value revealed that interpretation of meaning exerted a considerable influence on the reading comprehension of agricultural articles by the respondents. It suggested that a better interpretation of meaning would lead to better reading comprehension of the agricultural articles.

Influence of emphasis of ideas on reading comprehension

The findings on the influence of emphasis of ideas on reading comprehension are displayed in Table 13.

It could be seen that emphasis of ideas had a significant influence on reading comprehension, the Z value being positive and significant at 0.01 level of probability. These results explained that the reading comprehension would increase when there was better emphasis of ideas in the agricultural article.

Influence of the relevance of the message on reading comprehension

The data on influence of relevance of the message on reading comprehension are shown in Table 14.

It was indicated in this Table that the relevance of the message had a positive and significant influence on reading comprehension, with the Z value significant at 0.01 level of probability. It was evident from this result that the more the relevance of the message, the better would be the reading comprehension.

Table 13: Influence of emphasis of ideas on reading comprehension of agricultural articles by the respondents

Sl. No.	Story	Mean score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	4.775	5	700.0		
2.	Information feature	3.625	2	434.5		
3.	Process story (one message)	3.975	3	416.5	7358.5	17.89**
4.	Process story (two messages)	4.000	4	398.0		
5.	Short takes	3.150	1	148.0		

** Significant at 0.01 level

Table 14: Influence of relevance of message on reading comprehension of agricultural articles by the respondents

Sl. No.	Story	Mean score of variable	y	Rank total of reading comprehension (R)	L	Z
1.	Experience story	8.925	3	700.0		
2.	Information feature	8.700	2	434.5		
3.	Process story (one message)	9.125	4.5	416.5	6782.25	8.15*
4.	Process story (two messages)	9.125	4.5	398.0		
5.	Short takes	7.675	1	148.0		

** Significant at 0.01 level

Influence of simplicity of the message on reading comprehension

The results on the influence of simplicity of the message on reading comprehension are furnished in Table 15.

These results indicated that simplicity of the message had a positive and significant influence (0.01) level of probability) on reading comprehension. It was also made clear that reading comprehension would be more if the message is more simple.

Influence of completeness of the message on reading comprehension

The findings on the influence of completeness of the message on reading comprehension are provided in Table 16.

These findings revealed that completeness of the message was having a positive and significant influence on reading comprehension at 0.01 level of probability. This implied that greater the extent of completeness of the message, the more would be the reading comprehension.

Influence of average sentence length on reading comprehension

The influence of average sentence length on reading comprehension is depicted in the results displayed in Table 17.

Table 15: Influence of simplicity of the message on reading comprehensi
of agricultural articles by the respondents

Sl. No.	Story	Mean score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	2.450	5	700.0		
2.	Information feature	2.150	2	434.5		
3.	Process story (one message)	2.213	4	416.5	7377.0	18.20**
4.	Process story (two messages)	2.163	3	398.0		
5.	Short takes	2.000	1	148.0		

** Significant at 0.01 level

Table 16: Influence of completeness of the message on reading comprehesion of agricultural articles by the respondents

Sl. No.	Story	Mean score of variable	y	Rank total of reading comprehension (R)	L	Z
1.	Experience story	2.925	4	700.0		
2.	Information feature	2.325	2	434.5		
3.	Process story (one message)	3.125	5	416.5	7093.5	13.41*
4.	Process story (two messages)	2.775	3	398.0		
5.	Short takes	1.825	1	148.0		

** Significant at 0.01 level

Table 17: Influence of average sentence length on reading comprehensio
of agricultural articles by the respondents

Sl. No.	Story	Score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	7.49	1	700.0		
2.	Information feature	8.59	3	434.5		
3.	Process story (one message)	7.85	2	416.5	5168.5	-19.13*
4.	Process story (two messages)	8.61	4	398.0		
5.	Short takes	8.80	5	148.0		

** Significant at 0.01 level

It was indicated here that average sentence length had a negative and significant influence on reading comprehension of agricultural articles. It also suggested that when the sentence length of the article increased, the reading comprehension would decrease.

Influence of average word length on reading comprehension

The data on the influence of average word length on reading comprehension are furnished in Table 18.

It could be seen that average word length had a negative and significant influence on reading comprehension. It explained that the more the word length, the less would be the reading comprehension.

4.5 Variance in reading comprehension of agricultural articles in different formats

The mean scores of reading comprehension of different articles are presented in Table 19.

The F value was found significant indicating the significant differences among the mean reading comprehension scores of the articles. Then it was further probed to see which pairs were statistically significant with the help of the critical difference. It was found that all articles were significantly different from each other in terms of their reading comprehension, except the process story (one message) and process story (two messages).
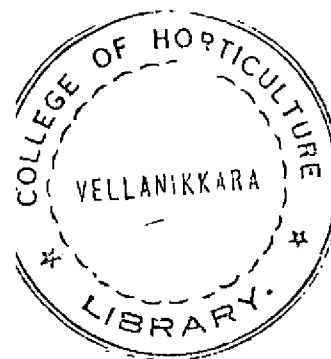
Table 18: Influence of average word of length on reading comprehension of agricultural articles by the respondents

Sl. No.	Story	Score of variable	y	Rank total of reading compre- hension (R)	L	Z
1.	Experience story	282	1	700.0		
2.	Information feature	314	3	434.5		
3.	Process story (one message)	306	2	416.5	5168.5	-19.13*
4.	Process story (two messages)	316	4	398.0		
5.	Short takes	330	5	148.0		

** Significant at 0.01 level

Table 19: Analysis of variance of reading comprehension of agricultural articles in different formats

(n = 140)

Sl. No.	Article	Mean	F
1	Experience story	67.286^a	
2	Information feature	56.143^b	
3	Process story-one message	53.933^c	576.755**
4	Process story-two messages	53.446^c	
5	Short takes	42.991^d	

CD. 0.999
** Significant at 0.01 level.
Means with the same superscript are not statistically significant.

Discussion

V. DISCUSSION

This chapter presents the discussion on the results obtained in this study. It is arranged in the sequence as that of the results, such as the distribution of respondents based on their personal characteristics, levels of reading comprehension of the agricultural articles by the respondents, relationship of selected personal characteristics of the respondents with their reading comprehension, influence of text variables on reading comprehension and the variation of agricultural articles in terms of their reading comprehension.

5.1 Distribution of respondents based on their personal characteristics

A birds eye view of the profile of the sample presented in Table 1 indicated that the sample was more or less following an even distribution. It would be interesting to note from the score ranges that the sample contained respondents with very low to very high levels in respect of most of the personal characteristics.

Further, it could be observed from the results that general reading habit level was fairly good for the entire sample as indicated by the better score range even for the low category. This might be probably due to the higher literacy level of the population and relatively increased use of print medium in the state.

Similarly the sample also showed a good standing in the case of background knowledge. It was only natural to get this result as the State Department of Agriculture was making intensive extension efforts on cultivation of vegetables in the study area for the last one year as a part of its intensive vegetable production programme. Moreover, due to the peculiar homestead farming system in Kerala, most of the farmers cultive some or the other vegetables in their homesteads to meet the home requirements which also might have added to get better scores for background knowledge.

Interestingly, reading habit of agricultural articles and mass media exposure were also not very low for the entire sample as evinced by the score ranges. Obviously, they were so probably due to the inherent involvement of print media use in the case of these variables.

5.2 Levels of reading comprehension of agricultural articles by the respondents

The results in Table 2 revealed that there was a considerable variation in the levels of reading comprehension among the respondents and they could not attain the full potential of comprehension of the agricultural articles read.

These findings made certain important revelations regarding the reading achievements of a society whose reading habits are relatively better. It is a well known fact, as Klare (1963) pointed out, that the perceptual habits in reading, once they are firmly established, become rather

mechanical in nature. In such cases, the reading achievements in terms of comprehension may become less, unless there is a 'set to learn' which is a specific kind of motivation. Nevertheless, this 'set to learn' would always be influenced by the felt needs of the individual also. The variation in the felt needs on the messages contained in the articles might have affected the reading comprehension resulting in its considerable variation among the respondents.

The principle of 'selectivity in perception' of the readers also might be another plausible reason for the variation in reading comprehension and their inability to attain the full potential. This principle suggests that at any given moment, the perceiver responds to only a small portion of the sensory information provided by his environment, and he organises it in certain ways (Secord and Backman, 1964). While reading an agricultural article, this selective perception mechanism might have worked, leading the reader to perceive certain aspects important and attend well only to them resulting in differential reading comprehension.

Another rationale that could be attributed to these findings relates to the 'skimming behaviour' of newspaper readers. Skimming is a reading behaviour, as Wainwright (1972) put it, 'wherein the reader seeks out the important information that the writer is trying to communicate and discard everything that is secondary or of minor importance, through quick eye movements across and down the page'.

Skimming, though it helps to grasp important ideas quickly, may not lead to full reading comprehension, particularly for a technical write-up like an agricultural article. Even then, many readers might have shown the skimming behaviour, as the medium was a newspaper which many times warrants skimming while reading various news items, and that might have caused the reduction in reading comprehension of agricultural articles.

Apart from all these possibilities the inherent inadequacies of the agricultural articles also might have contributed to the lack of attainment of the full potential of reading comprehension by the farmers.

These findings endorse the observations of Griffin (1949), who opined that majority of the newspaper readers usually would not attain accurate comprehension of what they read.

In view of the above discussion, the hypothesis that there would be no variation in the levels of reading comprehension of agricultural articles in daily newspapers among the farmers was rejected.

5.3 Relationship of reading comprehension of the respondents with selected personal characteristics

The results obtained from simple correlation coefficients, multiple regressions and path analysis are considered here for discussing the relationship of various

personal characteristics with reading comprehension of agricultural articles. It could be seen from Table 3 that all the selected personal characteristics, except background knowledge were significantly related to reading comprehension, with maximum degree of relationship in the case of general reading habit. Further, regression coefficients (Table 4) revealed that general reading habit and reading habit of agricutlural articles were the two significant variables in explaining the variation in reading comprehension. In path analysis also (Table 5), general reading habit and reading habit of agricultural articles have emerged as important variables in terms of their direct and indirect effects respectively.

General reading habit

General reading habit was more important than any other personal characteristic as evidenced by its highest correlation and regression coefficients and direct effect on reading comprehension.

Reading comprehension is a complex of skills which involves derivation of meanings, understanding the relationship between words, sentences and message units, interpreting them and generalising to suit the situations around. Acquisition of these skills, as Tinker (1965) stated, demands considerable training or practice which is often gained through general reading habit. Thus it is quite reasonable

to observe a strong relationship between reading comprehension and general reading habit.

Speed of perception and good vocabu important factors which may help the reading comprehension process (Wainwright, 1972). One can very well envision that these two aspects would be improved through general reading habit. This might be another validating reason for the influence of general reading habit on reading comprehension of agricultural articles.

This finding was in conformity with the observations reported by Crosiar (1975), Rosebery (1985) and Donelly (1986).

Reading habit of agricultural articles

It was interesting to note that reading habit of agricultural articles also had a high degree of positive correlation with a significance in explaining the variation in reading comprehension. It was further revealed that this variable had the maximum indirect effect on reading comprehension, of which the largest indirect effect was through general reading habit.

While reading an agricultural article, a reader may come across several semitechnical or technical words for which he may derive 'contextual meanings'. Berlo (1960) suggested that contextual meaning might be a useful device in introducing new or hard words in a communication, and

gradually make them familiar. An individual with a habit of reading agricultural articles might be possessing a storehouse of such contextual meanings to many of the semi-technical or technical words which might appear frequently in the communication of farm messages. In turn, this might have helped for reading comprehension of any given articles, leading to a finding of strong relationship between reading habit of agricultural articles and reading comprehension.

The largest indirect effect of the variable through general reading habit indicates another implication also for this finding. The perceptual skills in reading acquired through general reading habit might have explicitly influenced the reading habit of agricultural articles, which again could be endorsed by a strong intercorrelation (r=0.783) between these two personal characteristics (Appendix III). Hence, it was quite legitimate to find a higher rate of influence of reading habit of agricutural articles on reading comprehension of agricutural articles.

The present findings were in compliance with the findings of Sokomba (1977) who conducted a study among extension workers in Nigeria.

Age

It could be observed from Table 3 that age had a negative and significant relationship with reading comprehension.

While describing the physiological factors that influence reading efficiency, Tinker (1965) pointed out that visual acuity would gradually decrease after about 30 years of age. Thus, the individual may have to strain more to read the printed matter with same efficiency. This constraint might have led to a negative relationship between age and reading comprehension.

There are several forces influencing the comprehension and learning process in adulthood. One suh factor has been explained by Bayley (1966), wherein she postulated "an increase in mental resistance along with increase in age towards spending the effort necessary to break old patterns of thought in order to learn new techniques and new ways of organising knowledge". This behavioural mechanism might also have contributed to an inverse relationship of age with reading comprehension as manifested in this study.

Moreover, as the intercorrelation matrix (Appendix III) revealed, age had a negative correlation with education for the sample and hence it was natural to see that older farmers had lower reading comprehension levels influenced by their lower education levels also.

This result was in congruence with the findings reported by Crosiar (1975) from Wisconsin.

Education

A cursory look on Table 3 revealed the stimulating findings that education had a positive and significant relationship with reading comprehension of agricultural articles by farmers.

An analysis of this information has thrown limelight to certain psychological processes which influence a meaningful reception learning activated by formal education. Ausubel (1966) has rightly proposed 'Discriminability' of a learning material as a major cognitive structure variable, which help in clarity and interpretation of incoming information. This 'discriminability' might be acquired through ones' experience in information reception and to some extent through formal education. In the present study, the evidence of largest indirect effect of education through general reading habit (Table 5) and the significant intercorrelation between education and general reading habit (Appendix III) would subscribe to this theory of discriminability in meaningful learning. In addition, learning through generalisation would also be acquired by an individual with more formal education. It is needless to say that this discriminability and generalisation would have helped in translation, interpretation and extrapolation behaviours of the reader resulting in a significant relationship between education and reading comprehension.

Furthermore, the postulate of 'meaning association' to a communication stimulus suggested by Berlo (1960) could also be relevant in explaining this finding. It was suggested that meanings attached to various communication stimuli, whether denotative or connotative, are quite subjective in nature and to arrive at better meanings, the knowledge level of the individual might help. Here, if one could assume that the knowledge level as a function and consequence of the level of education, the observed relationship between education and identification of meanings and their inter-relationships are inherently inscribed in the process of reading comprehension.

This result, however, was in line with the findings of Kaur (1982), Siddaramaiah and Rajanna (1984) and Karande and Riswadkar (1987) and contradictory to the report of Sharma (1983).

Mass media exposure

A glimpse of Table 3 would elucidate the interesting finding that mass media exposure had a positive and significant relationship with reading comprehension of agricultural articles by farmers.

In the course of a discussion on the social functions of mass media, Lazarsfeld and Merton (1964) underscored the effects of mass media in 'canalising the social attitudes and awareness'. In farmers' context, this sort of an awareness through mass media may induce specific information needs,

which in one way become the motivation for them to seek details in a medium like agricultural article in a newspaper. This kind of motivating influence of mass media might have been one of the plausible reasons for a positive relationship between mass media exposure and reading comprehension.

Besides, another reason that could be attributed to the relationship of mass media exposure to reading comprehension was that of the contribution of mass media exposure in improving one's skills in deriving 'contextual meanings'. There is every chance for an individual who is frequently exposed to radio, television, newspaper and films to get familiarise with various technical terms and messages and easily visualise them when he comes across them somewhere later. This might be particularly true in the case of agricultural articles, as its messages which are of technical nature warrant some degree of visualising on the part of the reader for better comprehension.

This finding was corroborative to the results reported by Felstehausen (1965), Siddaramaiah and Rajanna (1984) and Noe (1986). However, it was not in line with the observations of Crosiar (1975) and Sharma (1983).

Social participation

An overview of Table 3 would unveil some interesting results regarding the relationship of social participation and reading comprehension. It could be observed that social

particilation was inversely and significantly correlated with reading comprehension of agricultural articles.

It is only logical to assume that an individual with higher social participation might satisfy several of his information needs through his interactions in various organisations. Moreover, such information would appear to be more valid for him due to the 'law of primacy' as explained by Secord and Backman (1964). Probably, those individuals with more social participation might have been using 'selective exposure' or 'skimming' while reading an agricultural article which would have turned to be the constraints for better reading comprehension.

Moreover, the positive intercorrelation of social participation with age (Appendix III) indicated that older respondents had more social participation, whose reading comprehension was relatively lower for the reasons explained elsewhere. Social participation had a negative correlation with general reading habit and these also might have been important reasons for this finding.

This result was not in conformity with the findings reported by Felstehausen (1965).

Background knowledge

A perusal of table 3 further revealed that background knowledge was not significantly related to reading comprehension of agricultural articles by farmers.

An individual with sufficient background knowledge on the subject matter dealt in the message might naturally tend to skim and search for some new information, while reading the agricultural article. But in some cases, where the message would seem to be relevant to his specific information needs or felt needs, the individual might get a motivation to look for details with a 'set to learn'. Both these conditions would depend on the situations and thus it was only natural to observe a non-significant relationship between background knowledge and reading comprehension.

The present finding was in agreement with the reports of Sperbeck (1967) but contradictory to the findings of Anderson (1978) and Yochum (1986).

In the light of the discussion the hypothesis that there would be no significant relationship between the personal characteristics of the farmers and their reading comprehension of agricultural articles was rejeted in the case of the variables such as age, education, mass media exposure, general reading habit, reading habit of agricultural articles and social participation. However, in the case of background knowledge the hypothesis was accepted.

Relationship of translation, interpretation and extrapolation behaviours with the personal characteristics of the respondents

A bird's eye view of Table 6 and Table 7 revealed that general reading habit was the most important among the

selected personal characteristics followed by reading habit of agricultural articles in influencing all the three comprehension behaviours such as translation, interpretation and extrapolation. Other variables such as age, education, mass media exposure and social participation, though they had significant correlations, were not significant in explaining the variation in reading comprehension. Further, Table 8, 9 and 10 indicated that general reading habit had maximum direct effect in all the comprehension behaviours, followed by reading habit of agricultural articles. In the case of largest indirect effect also, general reading habit was found to be the most important variable, in all three cases.

It was quite natural and interesting to observe that general reading habit and reading habit of agricultural articles influenced the three comprehension behaviours, probably due to the reading skills and ability to derive contextual meanings acquired through the reading habits. It is worth mentioning that other personal characteristics had their largest indirect effect through general reading habit, presumably due to the intercorrelations of those variables with general reading habit.

5.4 Influence of text variables on reading comprehension.

Style of writing

A glance of Table 11 revealed that style of writing of the agricultural article was positively and significantly

influencing its reading comprehension by farmers.

Reading comprehension, being a process involving word identification and associating meanings and relationships, might have been obviously influenced by the style of writing of the article. The style elements such as clarity, brevity and colour might help a reader to easily identify the important message units, their interrelations and applicability to the situations, thereby increasing the reading comprehension.

The finding of a related study by Calder (1984) supports this result.

Interpretation of meaning

The results displayed in Table 12 exposed the interesting finding that interpretation of meaning had a positive and significant influence on reading comprehension.

As discussed earlier, associative meanings are very important in reading comprehension, whether they are denotative or connotative. If the meanings are well interpreted, it is only rational to find a better reading comprehension. This might have been the possible reason for this result.

The present finding was in conformity with the observations made by Hartman (1984).

Emphasis of ideas

An overview of Table 13 revealed that emphasis of ideas had a positive and significant influence on reading comprehension of agricultural articles.

Whenever the ideas are highlighted in the article, it would help the reader to catch them at a glance and search for the details with an appropriate frame of reference. This might have helped, in turn, the reading comprehension giving a result of significant influence.

This finding was in line with the reports of Hartman (1984).

Relevance of the message

The results presented in Table 14 indicated that relevance of the message had a positive and significant influence on reading comprehension of agricultural articles.

As mentioned elsewhere, reading comprehension would always be affected by the readers' motivation and a 'set to learn'. The concept of readiness depends upon relevance to ones own unique setting. Unless the message is relevant one way or the other, this 'set to learn' could not be attained and that might have been the causal factor in getting a significant influence of relevance of the message on reading comprehension.

This finding justified the observations made by Kamath (1969).

Simplicity of the message

A perusal of Table 15 revealed that simplicity of the message had a positive and significant influence on reading comprehension.

In reading comprehension process, when the word meanings are identified and associated with interpretations, one would try to visualise the message to have a proper extrapolation. This visualisation would be relatively easy if the message is rather simple. This might be a plausible reason to find a significant influence of simplicity of the message on reading comprehension.

The present finding was in congruity with a related study conducted by Burnett and Clodius (1959).

Completeness of the message

A cursory look on Table 16 unveiled that completeness of the message had a positive and significant influence on reading comprehension of agricultural articles.

While discussing the application of structural rigour, Berlo (1960) has explained about inference that a receiver would make in a communication situation. These inferences would be the reflections of the individual's views and understanding, based on the message at hand. Unless the message

is complete, the receiver would not be in a position to synthesise it to make inferences. Inferences, being a part of the interpretation and extrapolation processes, have a role in reading comprehension process. Thus, it could be logically assumed that completeness of the message, which was essential to make inferences, was influencing the reading comprehension of agricultural articles.

This finding was corroborative to the observations made by Kamath (1969) and Duffy and Kabance (1982).

Average sentence length

It was interesting to find in Table 17 that the average sentence length had a negative and significant influence on reading comprehension of agricultural articles.

Miller and Selfridge (1950) pointed out that 'memory span' was closely related to the extent to which the organisation of the verbal context approximates. This 'memory span' for a long sentence would be relatively lesser than that of a short sentence. Moreover, the association of meanings and ideational sequence would be rather difficult for a reader in a long sentence. This might have influenced the variable average sentence length to have an inverse trend of influence on reading comprehension of agricultural articles.

This finding was in conformity with the observations made by Klare (1963).

Average word length

A glimpse of Table 18 brought to light the results that average word length had a negative and significant influence on reading comprehension.

As discussed elsewhere, reading comprehensioin is very much consorted with identification of word meanings and associative relationships. These processes would be much' easier when the 'fixation time' for each word is relatively less. The average length being a factor closely linked to 'fixation time' (Klare, 1963) may thus have a considerable influence on reading comprehension. Thus, it was only natural to find a negative and significant influence of average word length, which imply more 'fixation time', on reading comprehension of agricultural articles.

This finding was in support to the observations of Klare (1963).

In the light of the above discussions, the hypothesis that there would be no significant influence of the text characteristics on reading comprehension of agricultural articles was rejected, in th case of all the variables.

5.5 Variance of reading comprehension of agricultural articles in different formats

A glance of Table 19 revealed that the agricultural articles in different formats were distinct from each other significantly in terms of their reading comprehension. It was

interesting to note further that two process stories viz. process story (one message) and and process story (two messages) were mnot significantly different from each other though the number of messages contained in them varied.

The similarity between the two process stores, though varying in number of messages, clearly indicated that the reading comprehension would not be much affected even if there was a variation in the number of messages dealt in a process story. The probable reason might be that reader would look for specific recommendations on package of practices explained in the process story, as the intention of reading a process story being to know the 'how-to-do' of a particular practice.

Each format in journalism serves a distinct purpose, and one cannot be considered as superior to the other. Based on the situational demands and objectives in writing, the formats would be decided in preparation of a story. However, some formats were seen to be better comprehended, for which some psychological factors might have played a role.

Experience story, being the narration of the experience of an individual in the farming enterprise, was naturally comprehended better, as it might have elucidated 'empathy' of the readers initiating more visualisation in their minds because there was some degree of homogenity between the readers and the character in the story. A successful character in the story would influence the readers to some

extent as a 'role model'.

The information feature, being meant to create a general awareness about the theme among the readers, also recorded fairly good comprehension, as it did not demand a keenness while reading to grasp any specific recommendation. This easiness and its satisfying function to the general information needs might have contributed to its distinct reading comprehension.

It was only logical to find a relatively lower reading comprehension for both the process stories. Process stories being of pure recommendations of cultivation skills, warrant a 'set-to-learn' or readiness to go ahead in reading. Variation in the extent of readiness, certainly influenced by their felt needs, might have influenced the reading comprehension of process stories by the farmers.

Short-takes, being in the form of tips and bits of information, might have failed to keep a 'frame of reference' in the reader throughout the passage. This format, not strictly in the form of an article, was not superior in terms of its reading comprehension, for the obvious reasons.

Nevertheless, these formats are being widely used in writing for farm families based on the nature of the message and the purpose for which it is intended. Moreover, considering 'variety as a spice of life', different formats would

encourage the casual readers at least to have a glance on each story.

In view of the above discussion, the hypothesis that there would be no significant difference between various formats of agricultural articles in terms of its reading comprehension was rejected.

PERSONAL
CHARACTERISTICS
OF READERS

TEXT
CHARACTERISTICS
OF ARTICLES

AGE

EDUCATION

MASS MEDIA
EXPOSURE

GENERAL
READING HABIT

READING HABIT OF
AGRICULTURAL
ARTICLES

SOCIAL
PARTICIPATION

BACK GROUND
KNOWLEDGE

READING
COMPREHENSION

STYLE OF
WRITING

INTERPRETATION
OF MEANING

EMPHASIS OF
IDEAS

RELEVANCE OF
THE MESSAGE

SIMPLICITY OF
THE MESSAGE

COMPLETENESS OF
THE MESSAGE

AVERAGE
SENTENCE LENGTH

AVERAGE
WORD LENGTH

—————————— SIGNIFICANT RELATIONSHIP

— — — — — — — — NON-SIGNIFICANT RELATIONSHIP
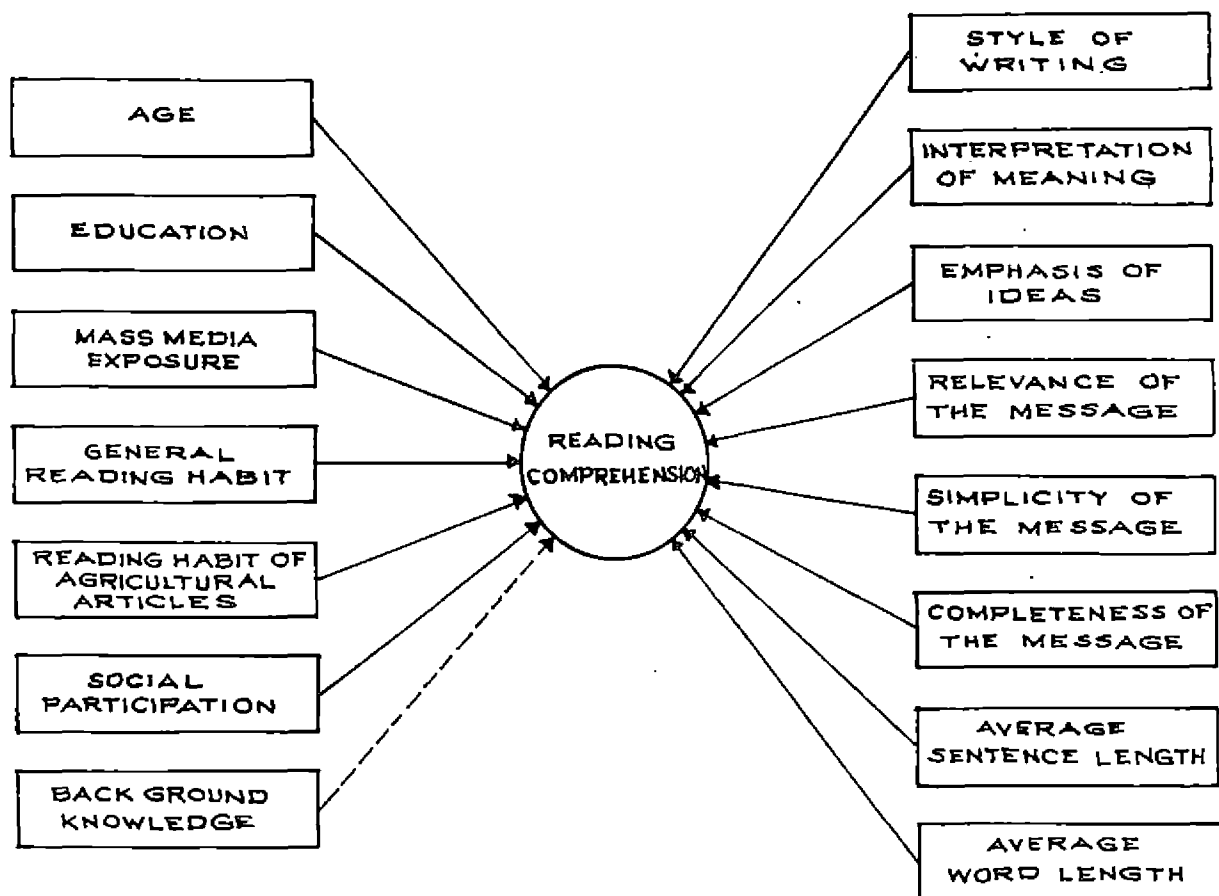
FIG.7. EMPIRICAL MODEL OF THE STUDY.

Summary

VI. SUMMARY

In all phases of development, communication of innovations has been accepted as a vital element. Various interpersonal and mass media are being utilised by the development agencies to assist in the transfer of technology to the rural areas, where the attention is being focussed in all developing nations. Among the various mass media, print media, particularly newspapers play an important role in places where literacy of the population is relatively high. Newspapers have become very powerful in communication in Kerala State, which ranks first in literacy in India, with a wider readership status and a variety of contents including development messages.

There are 18 dailies regularly publishing agricultural columns every week with articles on different aspects of agriculture and allied fields. Though the publication of these columns started several years back, its efficiency and impact have seldom been measured through systematic analytical procedures. Quite evidently, it has became a necessity to have empirical data on the qualitative dimensions of the agricultural articles, their reading comprehension and impact, to initiate fruitful discussions on the ways to improve these columns. In this context, the present study was framed to analyse the reading comprehension of agricultural articles in daily newspapers with the following objectives:

1. to develop a measurement index for reading comprehension of agricultural articles in daily newspapers,

2. to measure the reading comprehension of agricultural articles in daily newspapers,

3. to identify the relationship between the selected personal characteristics of farmers with their reading comprehension of agricultural articles,

4. to find out the influence of text characteristics of agricultural articles on the reading comprehension by farmers, and

5. to identify the variation of different formats of agricultural articles in terms of their reading comprehension.

The study was conducted in Trichur district of Kerala State, using five agricultural articles in different formats on various messages on vegetable cultivation, published in a leading Malayalam daily 'Mathrubhumi'.

Reading comprehension was measured with a sample of 140 farmer respondents, drawn purposively from various parts of the district, who were potential readers of agricultural columns in daily newspapers. The text characteristics of the articles were measured using another set of 40 respondents, who were experts in the field of agricultural journalism.

Reading comprehension of the agricultural articles was measured using the reading comprehension index developed and standardised for this study. The personal characteristics of farmer readers and text characteristics of agricultural articles were measured with the help of appropriate scales and score cards.

The data on reading comprehension and personal characteristics of farmer readers were collected distributing questionnaires among the respondents, who assembled at a place, immediately after reading the agricultural articles published on the same day. The text characteristics were measured later using the score cards distributed among the expert respondents, along with a copy of the newspaper containing the agricultural articles.

The data were analysed with the help of statistical tools such as correlation coefficient, multiple regression, multivariate path analysis, Pages L (trend) test and two way analysis of variance. The salient findings of the study are presented below:

1. There was considerable extent of variation in the levels of reading comprehension of agricultural articles by the farmers. The respondents could reach only to a maximum level of 67.50 in the reading comprehension of agricultural articles, though the potential level was 100.

2. The personal characteristics of farmer readers such as education, mass media exposure, general reading habit and reading habit of agricultural articles were positively and significantly related to their reading comprehension of agricultural articles, while two characteristics such as age and social participation had negative and significant relationship with reading comprehension. However, background knowledge of the farmers was not significantly related to their reading comprehension of agricultural articles.

3. General reading habit and reading habit of agricultural articles were the only two personal characteristics significantly explaining the variation in reading comprehension of agricultural articles by the farmers.

4. General reading habit was having maximum direct effect on reading comprehension of agricultural articles by farmers. All other personal characteristics had their largest indirect effect through general reading habit.

5. General reading habit was again the most important variable among the selected personal characteristics, followed by reading habit of agricultural articles, in influencing all the three comprehension behaviours such as translation, interpretation and extrapolation.

6. The text characteristics such as style of writing, interpretation of meaning, emphasis of ideas, relevance of the message, simplicity of the message and

completeness of the message had positive and significant influence on reading comprehension of agricultural articles by farmers. Two other text variables such as average sentence length and average word length had negative and significant influence on reading comprehension.

7. The agricultural articles in various formats were significantly different from each other except the process story (one message) and the process story (two messages) in terms of their reading comprehension by farmers.

Implications of the study

The index developed to measure reading comprehension of agricultural articles by farmers was found to be reliable and valid implying that it could be well adopted for similar research studies also.

The findings on the levels of reading comprehension of agricultural articles by farmers indicate the need of efforts to increase their levels of reading comprehension to attain maximum possible transfer of the messages through the agricultural columns. The findings further suggest that there is a need to improve the general reading habit among the literate farming community which would help them to make efficient use of the print medium through better comprehension. The development efforts, particularly that of

voluntary organisations, are to be oriented in this direction also.

All the text variables, having considerable influence on reading comprehension, are to be considered while writing and editing agricultural articles for a medium like newspaper. The findings clearly imply the need for adequate attention by the writers and deskmen on the aspects like better styles of writing, interpretation of meaning, proper emphasis of ideas, relevance, simplicity and completeness of the message and use of shorter sentences and words in the agricultural articles to improve their comprehension by the intended readers.

Suggestions for future research

As implied by the findings of this study, there might be several personal characteristics of the farmers with sociological and psychological dimensions that could influence their reading comprehension of agricultural articles. It would be worthwhile if few more attempts are made to analyse reading comprehension taking all possible reader characteristics into consideration.

Similarly, text characteristics, which are often a matter of concern by the journalists, are also required to be analysed in depth incorporating newer variables to enhance the theoretical and empirical knowledge in agricultural journalism to help its further improvements.

The score cards used in this study, call for rigorous reliability and validity tests to standardise the same. Some efforts in that line also may help to have better measurement tools in the field of agricultural journalism.

In addition to reading comprehension studies, there is a need to have systematic analyses on the impact of the agricultural columns in terms of increase in awareness, knowledge and symbolic adoption of the messages among the farmers.

References

REFERENCES

ABERNATHY,H.S., 1987, An investigation of the effects of metecognitive adjunct question on reading comprehension. Diss. Abstr. Inter. 47: 2969

AHUJA,B.N., 1979, Theory and Practice of Journalism. Surjeet Publications, Delhi.

ANDERSON,R.C., 1978, Schema-directed processes in language comprehension. In Lesgold, A.M., Pellegrino, J.W., Fokkema, S.D. and Glaser, R. (Eds.) Cognitive Psychology and Instruction. Plenum Press, New York.

ANDERSON, R.C., GOLDBERG, S.R. AND HIDDE, J.T., 1971, Meaningful processing of sentences. J. Edu. Psychol., 62: 395-399

ARON, HELEN, 1984, The influence of background knowledge on non-native students' memory for reading passages. Unpublished Ed.D.Dissertation, Rutgers University, The State University of New Jersey.

AUSUBEL, D.P., 1966, Meaningful reception learning and the acquisition of concepts. In Klausmeir, H.J. and Harris, C.W. (Eds.) Analyses of Concept Learning. Academic Press, New York.

BAXTER,W.N., 1967, A study of the comprehension of swine terms and concepts by Wisconsin Farmers. Unpublished M.S.Thesis., University of Wisconsin-Madison.

BAYLEY., NANCY, 1966, Learning in adulthood: the role of intelligence. In Klausmeir, H.J. and Harris, C.W., (Eds.) Analyses of Concept Learning. Academic Press, New York.

BERLO, D.K., 1960, The Process of Communication. Holt, Rinehart and Winston, New York.

BLOOM, BENJAMIN, S., (Ed) 1956, Taxonomy of Educational Objectives: Book I Cognitive Domain. David Mckay Co. Inc. New York.

BONEAU, C.A., 1960, The effects of violations of assumptions underlying the t-test. Psychol. Bull. 57 (1): 42-54

BORMUTH,J.R.,1969, An operational definition of comprehension Instruction. In Goodman K.S. and Fleming J.T., (Eds). Psycholinguistics and the Teaching of Reading. International Reading Association, Newark.

BOSTIAN, LLOYD, R and BYRNE, TOMAS, E., 1984, Comprehension of styles of science writing. Journalism Quarterly, 61: 676-678.

BRUNER,J.S., GOODNOW, J.J. AND AUSTIN, G.A., 1956, A Study of Thinking. John Wiley and Sons Inc. New York.

BURNETT, C. AND CLODIUS, R.L., 1959, Procurement policies and practices of a selected group of dairy processing firms. Part.3., College of Agriculture Research Bulletin. 211: University of Wisconsin-Madison.

CALDER,J.W., 1984, The effects of story structure instruction on third grades' concept of the story, reading comprehension, response to literature and written composition. Unpublished Ph.D.thesis. University of Washington.

CARROLL, J.B., 1972, Defining language comprehension: Some speculations. In Carroll, J.B. and Freedle R.S., (Eds.) Language Comprehension and the Acquisition of Knowledge. Winston and Sons. Washington, D.C.

COLEMAN, E.B. AND MILLER,G.R., 1968, A measure of information gained during prose learning. Reading Research Quarterly, 3: 369-386.

CROSIAR, J.R., 1975, Comprehension and readability of pesticide labels. Unpublished M.S.Thesis. University of Wisconsin - Madison.

DALE, EDGAR, 1956, The problem of vocabulary in reading.Educ. Res. Bull., 35 (5): 12-16.

DELLA-PIANA, G.M. AND ENDO, G.T. 1973, Reading Research. In Travers, R.M.W. (Ed.) Second Handbook of Research on Teaching. Rand McNally College Publishing Co., Chicago.

DOLCH, E.W., 1948, Graded reading difficulty. Problems in Reading. The Garrard Press, Champaign.

DONELLY, M.H., 1986, The effect of composition activities on reading comprehension of academically underprepared community college students. Unpublished Ed.D. Dissertation. Northern Arizona University.

DOWNINE, N.M. and HEATH,R.W.,1965, Basic Statistical Methods. Harper and Row, New York.

DUFFY, T.M. AND KABANCE, P., 1982, Testing a readable writing approach to text revision. J. Educ. Psychol., 74: 733-748.

DUPUIS, MARY,M., 1980, The cloze procedure as a predictor of comprehension in literature. J. Educ. Res. 74 (1):

FASS, W. AND SCHUMACHER, G.M., 1978, Effect of motivation, subject activity and readability on the retention of prose materials. J. Educ. Psychol., 70: 803-807.

FELSTEHAUSEN, H.H., 1965, Economic Knowledge and Comprehension in a Netherlands Farming Community. Bulletin No.26. Department of Rural Sociology, Agricultural University Wageningen.

FLESCH, R.F., 1948, A new readability yardstick. J. Applied Psychol. 32: 221-233.

FONSECA, LUIZ, 1959, Comprehension of pictorial symbols: A study in rural Brazil, A study in rural Wisconsin. Unpublished M.S.thesis, University of Wisconsin-Madison.

FOX, RODNEY, 1952, Agricultural and Technical Journalism. Prentice Hall Inc. New York.

FRIJDA, NICO, H., 1978, Memory process and instruction. In Lesgold, A.M., Pellegrino,J.W., Fokkema, S.D. Glaser, R. (Eds.). Cognitive Psychology and Instruction Plenum Press, New York.

GARRET, H.E., 1967, Statistics in Psychology and Education Vakils, Feffer and Simons, Bombay.

GOODE, W.J. and HATT,P.K., 1952, Methods of Social Research. McGraw Hill Book Co., New York.

GOVERNMENT OF INDIA, 1987, Report of the Registrar of Newspapers. Ministry of Information and Broadcasting, New Delhi.

GRIFFIN, P.F. 1949, Reader comprehension of news stories: a preliminary study, Journalism Quarterly, 26: 4.

GUILFORD, J.P., 1936, Psychometric Methods, McGraw Hill Book Co., New York.

GUISER, D.D., 1986, An examination of the relationship between recreational reading and reading achievement for eighty six fifth and sixth grade students. Unpublished Ph.D.thesis. Michigan State University.

HADLEY, READ, 1955, Getting Information to Farm Families University of Illinois, Urbana, Illinois.

HARTMAN, DIANE, M., 1984, An investigation into the predictive relationship of ten writing assessment variables to reading comprehension. Diss. Abstr. Inter. 45 (5):

HEAD, M.H., 1987, Factors affecting summary writing and their impact on reading comprehension assessment. Diss. Abstr. Inter., 47 (9):

HESS, R.K., 1985, The relationship of passage imagery, subject imagining ability, reading strategy instructions and reading comprehension. Unpublished Ph.D.thesis, University of South Carolina.

JAYARAM, K., 1980, Evaluation of "Krishi Vignana" a quarterly farm journal in Kannada published by the U.A.S., Bangalore. Unpublished M.Sc. (Agri.) Thesis. Univ. Agric. Sci., Bangalore.

KAMATH, M.G., 1969, Writing for Farm Families Allied Publishers Pvt., Ltd., Bombay.

KARANDE,A.G. AND RISWADKAR, M.R. 1987, Use of print media in information communication in animal husbandary. Maharashtra J. Extn. Edn. 6: 51-54.

KARIPPAI,R.S.1981, Credibility and utilization pattern of information sources by small farmers. Unpublished M.Sc. (Ag) Thesis, Kerala Agricultural University, Vellayani, Trivandrum.

KARIPPAI, R.S. and MENON,A.G.G., 1987, Print media research for rural development. Background papers. International seminar on Agricultural Communication and Media Management; N.I.R.D., Hyderabad.

KAUR, SHAVINDER, 1982, Comprehension and use of information – A study of correspondence course for farm ladies in Punjab. Unpublished Ph.D.thesis, Punjab Agricultural University, Ludhiana.

KERLINGER, F.N., 1964, Foundations of Behavioural Research. Holt, Rinehart and Winston, New York.

KINTSCH.W. AND VIPOND,D., 1978, Reading comprehension and readability in educational practice and psychological theory. In Nillson I.G., (Ed.) Memory, Process and Problems, Lawrence Erlbaum Associates, Hillsdale, New Jersey.

KLARE, G.R., 1963, The Measurement of Readability. Iowa State University Press, Iowa.

LAND,K.C., 1969, Principles of path analysis. In Edgar P.Borgatta (Ed.) Sociological Methodology. Jossey Bon, San Fransisco.

LAZARSFELD, P.F. and MERTON, R.K., 1964, Mass communication, popular taste and organised social action. In Bryson, L. (Ed.) The Communication of Ideas. Cooper Square Publishers, Inc., New York.

LI, C.C. 1955, Population Genetics. The University of Chicago Press, Chicago.

MACDOUGALL, C.D., 1963, Interpretative Reporting. MacMillan and Company, New York.

MARKS, C.B., DOCTOROW, M.J. AND WITTROCK, M.C., 1974, Word frequency and reading comprehension J. Educ. Res.., 67: 259-262.

MARSHALL, J.S., 1957, The relationship between readability and comprehension of high school physics text books. Dissertation Abstracts. 17: 64.

McGUIRE, W.J., 1973, Persuasion, resistance and attitude change, In Pool I.S.. and Wlbur Schraam (Eds.) Handbook of communication, Rand McNally College Publishing Co., Chicago.

McNEMAR,G., 1962, Psychological Statistics John Wiley and Sons Inc., New York.

MEDDIS, RAY, 1975. Statistical Handbook for Non Statisticians McGraw Hill Book Co. (UK), Ltd., England.

MILLER, G.A. and SELFRIDGE, J.A., 1950, Verbal context and the recall of meaningful material. American J. Psychol. 63: 176-185.

MORRIS, JACKSON, E.1966, Principles of Technical Writing. McGraw Hill Book Co., New York.

MOSBURG, L. and SHIMA, F. 1969, Comprehension of Connected Discourse. Southwest Regional Laboratory, Inglewood, California.

MUNEGOWDA, S., 1978, A field experiment on the use of radio and newspaper in agricultural communication and other related aspects, Unpublished M.Sc. (Agri.) Thesis. Univ. Agric. Sci., Bangalore.

NESTVOLD, KARL. J., 1972, Cloze procedure correlation with perceived readability. Journalism Quarterly,49: 592-594.

NOE, K.L.S., 1986, Metacognitive awareness in job related reading, Diss. Abstr. Inter., 47 (4): 1265.

OHLHAUSEN, M.M., 1985, The effect of reader and text structure variables on the ability to identify the important information in social studies text: The existence and acquisition of test structure and content schemata. Unpublished Ph.D.Thesis, The University of Iowa.

PARKINSON,C.N., KAMATH, M.V. AND RUSTOMJI, M.K., 1985, What Journalism is all about, India Book House Pvt.Ltd., Bombay.

PATTERSON, HELLEN, M., 1949, Writing and Selling feature Articles. Prentice Hall Inc. New York.

PHILLIPS, A. 1982, Attitude Correlation of Selected Media Technologies: A Pilot Study. Annenberg School of Communication, Los Angeles.

POTTER, T.C., 1968, A Taxonomy of Cloze Research, Part I: Readability and Reading Comprehension. South West Regional Laboratory, Inglewood, California.

RAJAN, P. K., 1982, Effectiveness of communication through the Farm News Service of the Kerala Agricultural University. Unpub. M.Sc., (Ag) thesis. Kerala Agril. Univ. Vellayani, Trivandrum.

ROBERTS, J.M., 1986, The effect of interest on achievement on standardised reading tests. Unpublished Ed.D.Dissertation, University of Miami.

ROSEBERY, A.S., 1985, Semantic and syntactic bases of text comprehension. Unpublished Ed.D. disseration, Harward University.

ROTHKOPF, E.Z. 1970, The concept of mathemagenic activities. Rev. Ednl. Res., 40: 325-336.

RUMELHART, D.E.and ORTONY,A., 1977, The representation of knowledge in memory. In Anderson R.C., Spiro R.J. and Montague, W.E. (Eds.) Schooling and the Acquisition of Knowledge. Erlbanm, Hillsdale, New Jersey.

SAMUELS, S.JAY, 1983, A cognitive approach to factors influencing reading comprehension J. Educ. Res., 76 (5): 261-266

SAWANT, G.K., Khuspe, T.S. and Harkal, R.B., 1984, Readability of printed Marathi text on Jowar (Sorghum) as perceived by farmers of Maharashtra. Background papers National Seminar on Agricultural Journalism: Problems and Prospects. G.B.P. University of Agriculture & Technology, Pantnagar.

SECORD, P.F. and BACKMAN, C.W., 1964, Social Psychology. McGraw Hill Book Co., New York.

SERRA, MARY, C., 1953, How to develop concepts and their verbal representations. The Elementary School Journal, (January) 275 - 385.

SETHU RAO, M.K., KARIPPAI, R.S. and GANGADHARAPPA,N.R., 1987, Use of modern media for agricultural development.Background papers, International Seminar on Agricutural Communication and Media Management, NIRD, Hyderabad.

SHANNON,C.E., 1951, Prediction and entropy of printed English. Bell System Technical Journal, 30: 50-54.

SHARMA, VENKATESHA, 1983, An analysis of the readability, content and usefulness of 'Krishi Vignana' Journal by farmers and extension workers, Unpublished. M.Sc. (Agri.) Thesis, Univ.Agric.Sci., Bangalore.

SIDDARAMAIAH,B.S. and RAJANNA, B., 1984, Relative effectiveness of combinations of radio, slide show and film show - An experimental evidence. Indian J. Extn. Edn., 20 (1 & 2):

SINGH, R.K. and CHAUDHARY, B.D., 1979, Biometrical Methods in Quantitative Genetic Analysis: Kalyani Publishers, New Delhi.

SOKOMBA, J.T., 1977, Reception, understanding and use of extension publications by extension workers in Nigeria. Unpublished M.S.Thesis. University of Wisconsin-Madison.

SORENSON, D.D., 1956, Knowledge and understanding of soils by Wisconsin Farmers. Unpublished M.S.thesis, University of Wisconsin - Madison.

SPERBECK, J.M., 1967 Comprehension of dairy terms by Wisconsin Farmers. Unpublished M.S.thesis, University of Wisconsin - Madison.

STICHT, T., FOX, L., HANKE, R. and ZAPF, D.,1977, The Role of Reading in the Navy (NPRDCTR-77-40) Navy Personnel Research and Development Centre. San Diego.

TAYLOR, SUSAN, K., 1976, Comprehension of food preparation terminology by Wisconsin extension homemakers Unpublished M.S.Thesis, University of Wisconsin - Madison.

TAYLOR, WILSON, L., 1953, Cloze procedure: A new tool for measuring readability, Journalism Quarterly, 30: 415-433.

THERING, ANN, 1986, Scientistics' comprehension, reading speed, and evaluation of science writing styles. Unpublished M.S. Thesis. University of Wisconsin - Madison.

THROPE, L.D., 1986, Prior knowledge and reading: An investigation of fourth grade social studies text books and basal readers. Unpublished Ph.D. thesis, Claremount Graduate School.

TINKER,M.A., 1965, Bases for Effective Reading. University of Minnesota Press. Minneapolis.

TINKER M.A. and McCULLOUGH C.M., 1962 Teaching Elementary Reading Appleton-Century-Grofts, New York.

TUINMAN, J.J., 1970, Assessment of the Acquisitioin of Information from Reading Prose Passage. Paper presented at the Annual Conference of National Reading Conference, St.Petersburg, Florida.

UNESCO, 1982, Many Voices, One World. Oxford & IBH Publishing Co., New Delhi.

WAINWRIGHT, G.R., 1972, Rapid reading made Simple Rupa and Co., Calcutta.

WELFORD, A.T. 1968, Fundamentals of Skills. Methuen, London.

WESTLEY,BRUCE, 1953, News Editing. Oxford and IBH Publishing House, New Delhi.

WILSON, J.A.R., ROBECK, M.C. and MICHAEL, W.B., 1969, Psychological Foundations of Learning and Teaching. McGRAW Hill Book Co., New York.

WRIGHT, S. 1921, Correlation and Causation. J. Agric. Res., 20: 357-585.

YARD, ILA,Z., 1971, Comprehension of home economics terminology by homemakers and professional home economists. Unpublished M.S.thesis, University of Wisconsin-Madison.

YOCHUM, M.N., 1986, Children's comprehension of informational text: the effect of reader and text variables. Unpublished Ph.D. Thesis, The University of Michigan.

ZALAKI, C.G. 1973, Study on the awareness, use and readability of agricultural publications by farmers in Bangalore district of Mysore State. Unpublished M.Sc. (Agri.) Thesis. Univ. Agric. Sci., Bangalore.

ZEIER, J.M., 1977, Use and comprehension of nutritional labeling. Unpublished M.S. thesis, University of Wisconsin-Madison.

ZINKHAN, GEORGE and BLAIR, EDWARD, 1984, An assessment of cloze procedure as an advertising copy test. Journalism Quarterly, 61: 404-408

Appendices

APPENDIX I

QUESTIONNAIRE ON PERSONAL CHARACTERISTICS

1. Name   :

2. Address   :

3. Age   :

Please put   mark against the most appropriate answer
for each of the following.

4. Educational qualification - Primary School (upto 7th
Standard)

- High School

- Pre degree

- Graduate

- Post graduate

5. Listening to radio
   programmes   - Regularly

- Occasionally

- Never

6. Viewing movie films   - Regularly

- Occasionally

- Never

7. Watching television   - Regularly

- Occasionally

- Never

8. Reading daily newspaper   - Regularly

                                   - Occasionally

                                   - Never

9. Reading magazines and
    other periodicals   - Regularly

                                   - Occasionally

                                   - Never

10. Reading fictions and
    other books   - Regularly

                                     - Occasionally

                                     - Never

11. Reading all available
    leaflets and other
    printed material like
    bit notices etc.   - Regularly

                                   - Occasionally

                                   - Never

12. Reading farm pages in daily
    newspaper   - Regularly

                                   - Occasionally

                                   - Never

13. Reading agricultural articles
    in farm magazines and other
    periodicals.   - Regularly

                                   - Occasionally

                                   - Never

14. Reading leaflets and other
    such printouts on agriculture   - Whenever available

                                     - Sometimes

                                     - Never

15. Membership and official position
    in any organization

    (including social, cultural,
    political or labour organi-
    sations, co-operatives
    recreation clubs etc).   - Member and office
                                       bearer in more than
                                       one

                                     - Member and office
                                       bearer in one

                                     - Member in more than
                                       one

                                     - Member in one

                                     - Not a member in any
                                       organisation

16. If a member, frequency of
    participation   - Participates in all
                                       meetings and other
                                       activities.

                                     - Participates in meet-
                                       ings and other activi-
                                       ties occassionally

                                     - Does not participate
                                       in meetings or other
                                       activities.

17. Farming status   - Full time farmer

                                     - Farming is only a
                                       subsidiary occupation

18. Experience in vegetable
    cultivation

    - Cultivates vegetables
      regularly

    - Cultivates vegetables
      for the last one year

    - Cultivates vegetables
      since last season

19. Apart from experience in
    cultivation, knowledge on
    vegetables is acquired
    through

    - Seeing cultivation of
      vegetables by others

    - Reading literature on
      cultivation of
      vegetables

    - Listening on cultiva-
      tion of vegetables
      from others

    - Does not have any
      knowledge on vege-
      tables

READING COMPREHENSION OF AGRICULTURAL ARTICLE

(Title of the article ....)

Translation

1. What is the main theme in this article?

2. What are the supporting ideas given in the article to explain the main theme?

3. Which are the most difficult words for you in the article and what meaning you assign for them?

4. Write down the message contained in the article in your own words, as you explain to others.

5. Write down an outline of the matter read.

Extrapolation

11. What would be the immediate constraints in the adoption of the message?

12. What would be the results of its adoption at your farm level?

13. What would be the implications of the acceptance of the idea at the community level?

14. What would be the skills required to adopt the message?

15. Indicate the points which need more detailed information in your local context.

16. What may happen if the message suggestions go wrong?

READING COMPREHENSION OF AGRICULTURAL ARTICLE

(Title of the article ....)

Translation

1. What is the main theme in this article?

2. What are the supporting ideas given in the article to explain the main theme?

3. Which are the most difficult words for you in the article and what meaning you assign for them?

4. Write down the message contained in the article in your own words, as you explain to others.

5. Write down an outline of the matter read.

Interpretation

6.   How do you relate the message to your own present
     situation?

7.   How do you relate the message to your past experiences?

8. · Indicate the relationship between the message units in
     the article.

9.   Mention in what way the message is advantageous to you?

10. Indicate the limitations of the message in the local
     context.

Extrapolation

11. What would be the immediate constraints in the adoption of the message?

12. What would be the results of its adoption at your farm level?

13. What would be the implications of the acceptance of the idea at the community level?

14. What would be the skills required to adopt the message?

15. Indicate the points which need more detailed information in your local context.

16. What may happen if the message suggestions go wrong?

APPENDIX III

Intercorrelation matrix between personal characteristics of the respondents and their reading comprehension of agricultural articles.

(n=140)

Var. No.	Personal characteristic	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1	Age	–						
X_2	Education	-0.393**						
X_3	Mass media exposure	-0.327**	0.698**	–				
X_4	General reading habit	-0.256**	0.484**	0.394**	–			
X_5	Reading habit of agricultural articles	-0.178*	0.349**	0.271**	0.783**	–		
X_6	Social participation	0.351**	-0.247**	-0.212*	-0.249**	-0.334**	–	
X_7	Background knowledge	0.038	-0.029	-0.138	-0.094	-0.058	0.074	–

** Significant at 0.01 level

* Significant at 0.05 level