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# EFFECTIVENESS OF MULTIMEDIA MADE FOR SOIL TESTING BY CLUSTER ANALYSIS: TO THE FARMERS OF INDAPUR TAHSIL DISTRICT PUNE

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**ABSTRACT**

*Agricultural Geography deals with various factors affecting on soil. Soil is main factor wich is important for crop growth. The Physical, chemical and biological properties of soil are main element for plant growth and it can be understand by the soil testing process in the soil laboratory.*

**KEYWORDS:** Agricultural Geography , testing process

## INTRODUCTION:

Collecting soil sample from farm land, sending it to the laboratory, laboratory analysis, and reporting the elements available in soil is man work in this process. The problems related to the collection of soil sample and communicating this knowledge to farmers was the main objective of this work. The study includes making the multimedia devices on soil sample collection and implementation of the soil test report. To overcome all types of difficulties, as discussed above the researcher has developed the Guidance Booklet and communication VCD in *Marathi*.

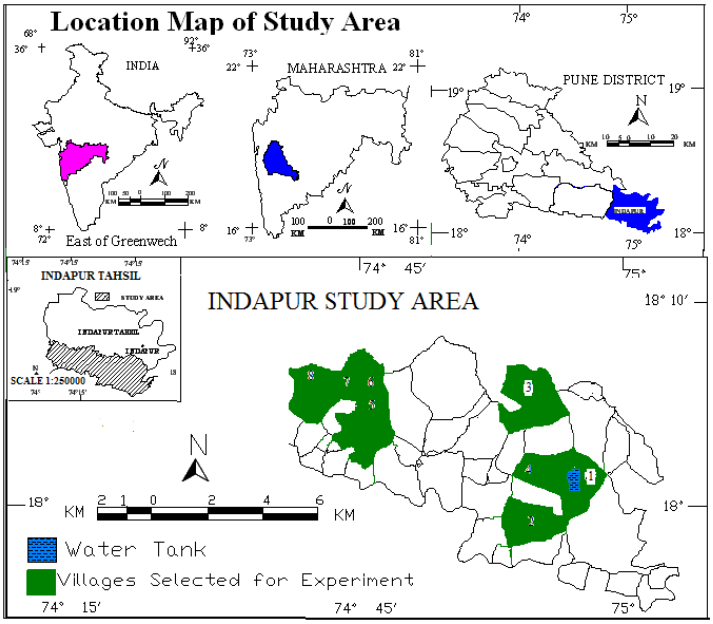
## LOCALITY OF STUDY AREA:-

The present study was conducted for 7 villages of Indapur tahsil of Pune district in Maharashtra state which is under Nira Left Bank Canal (NLBC)irrigation. The study area lies between $17^0$, 53' 44.23'' to $18^0$, 7' 34.64'' North longitude and $74^0$, 40' 6.22'' to $75^0$, 1' 6.7'' East latitude of Pune district. The study area lies in the south-east part of Pune district of Maharashtra state. Administratively, it is bounded by Madha tahsil (Solapur District) towards the east, Baramati tahsil (District Pune) towards the west, Phaltan tahsil of Satara districts and Malsiraus tahsil of Solapur district towards the south and Nira Left Bank Canal is to the north. This NLBC area consists of 37 villages and one urban center (Walchandnagar Town) of Indapur tahsil .The total area of study covering villages of Indapur is 30,009 sq. hectares is under canal irrigation. The southern boundary of the study area is marked by Nira River and north boundary is marked by Nira Left Bank Canal line in Baramati tahsil of Pune district. Study villages include 1. Wadapuri, 2.Nimgaon K., 3.Kati,4. Redni, 5.Lasurne, 6.Bori, 7. Anthurne, 8. Sansaar. Map No.1.

## OBJECTIVES OF THE STUDY:

1. To conduct communication experiment by multimedia on soil testing process.
2. To asses, the effectiveness of the soil testing multimedia and awareness created among farmer of Indapur tahsil.
3. To analyses village groups by clustering technique.

**Location map of study Center**
**Map No.1.**




## DEVELOPMENT OF MULTIMEDIA ON SOIL TESTING PROCESS:

The researcher developed the Multimedia on Soil Testing Process as communication material for the farmers of study area. The Guidance Booklet, VCD and an Achievement test was also developed for farmers' evaluation before and after VCD show.

The farmers from the study area were *marathi* speaking, so the researcher decided to develop the VCD in *marathi* language, namely परीक्षण मृदेचे संवर्धन शेतीचे [*Parikshan Mrudeche Sanvardhan Shetiche*]. The following thirteen development steps for VCD development were followed: 1.Importance of VCD in communication, 2.Objectives of the multimedia communication model, 3.Nature and planning of communication model, 4.Development of research tools, 5.Outline of communication model , 6.First pilot study, 7. Validation and reliability of VCD, 8. Essential changes in research tools, *9.* Second pilot study (Use of Improved Research Tools), 10. Validation and reliability of VCD, GB and achievement test, 11. Correlation of objectives and result, 12. Conclusions and recommendations, 13. Report and presentation.

Experts suggested the need of reading Guidance Booklet (GB) before watching the VCD. It is essential to know the purpose of watching the VCD. It will be helpful to create the proper mindset of the farmers to watch VCD. The information in GB should be useful to understand the use, operating system, contents from each section of VCD and standard questions and answers. This GB is developed for reading before watching the VCD. The researcher applied all the steps shown below for making Guidance Booklet as per steps written in Research Booklet of Yeshwantrao Chavan Maharashtra Open University Nasik- (YCMOU) **1.** Location of GB in subject communication, 2. Objectives of GB, 3. Nature and Planning of GB,4. Development of GB, 5. Outline of GB,6. Use of GB in Pilot Study, 7. Changes in GB,8. GB as a Proven Tool, 9. Actual use of GB. GB was used to read by farmer before VCD show.

The validity and Reliability of these GB & VCD was satisfactory and acceptable for the experiment on farmers group of Indiapur tahsil.

For the farmers evaluation an achievement test of the 35 marks multiple choices *Marathi* language questions was developed and included for evaluation of farmers after the VCD show. The units Introduction, Equipments to take soil sample, Collecting SS, Collecting representative SS, Effects of soil humus deficiency

on crops, Interview of experienced farmer, Laboratory Test, Fertilizers recommendation and Knowledge, Comprehension, Implements, Skills these objectives were taken in to consideration which preparing prototype of the test. The information on soil testing was arranged systematically in the script for VCD. With the help of the script, the dialogue about different characteristics and the steps, were made separately and actual shooting was done with video camera which was then converted in to digital form (VCD).

## RESEARCH METHODOLOGY & DATA BASE:

'Systematic sampling' method was used for the selection of site, villages and convenient sampling for respondent for the experiment.

## SELECTION OF VILLAGES AND RESPONDENT FARMERS:-

The study was conducted in Indapur tahsils of Pune district through which the Nira Left Bank Canal passes. The list of villages which receive canal water was prepared. The 'systematic sampling' method depending on the distance variation of 10, 20, 30, and 40 KM away from tahsil headquarter was selected. As a whole, 120 respondents farmers each 15 from 8 villages, which mentioned above were selected for conducting the experimental study. The criteria for selecting the farmers was as follows- Farmers having agricultural land, cultivated by themselves, can read and write *Marathi* , do not know about soil testing process, have not tested farm soil and farmers of any age group. The information of farmer's name, age, education and land holding capacity was also recorded on the test paper given them.

### 1. Development of VCD

The VCD was developed as a communication medium to serve as a comprehensive resource to the farmers. By using this VCD, the farmers will have access to knowledge about the process of soil testing. The VCD was developed by the subject title, need of soil testing, salts affected soil, taking soil sample, making representative soil sample, interview of farmer, nutrient deficiency of crops, the laboratory work, implementation of soil test report. Researcher has developed the communication VCD by showing to subject matter experts, instructional designer, technical expert, and extension education expert and their opinion has been taken into account to develop the tools.

### 2. Experiment:

In each selected village, educated and farmers group who had not tested their farm soil but cultivate by themselves were contacted for class room training with sufficient seating space equipped with TV, VCR, continuous electric supply. The group of 15 farmers were given pre test to solve within 20 minutes to measure their existing knowledge. After pretest, the GB was given for reading with time limit of 15 minutes. Then, VCD was shown for 22 minutes. Lastly, test paper of same questionnaire was given to be solved within 15 minutes immediately after VCD show which is known as post test. This exercise was conducted on all selected 8 groups in study area.

## CLUSTERING PROCEDURE:

In doing the same work, we took the difference of Pre and Post marks for the entire village. Here we obtained values for each village. Defining the village as cluster variables we formed the clusters. Cluster analysis is applied for the 8 Indapur tahsils. For this cluster analysis we considered the difference of pre and post marks of respondents. For cluster analysis sample size of each village must be the same. So we selected 15 samples of respondent farmers from each village.

## RESULT AND DISCUSSION:

The farmers' personal information and solved achievement test marks were checked by giving marks to each equation and arranged in tabulated form.

**1. Personal Characteristics of the Respondents and average Marks:-**

Age, education and economic background of the respondents affect the understanding and knowledge of the learners. Therefore, these factors of each respondent were considered for the study. The researcher has studied the indirect effect on reading GB, watching VCD and the test given on this content.

**2. Age Structure of Respondents and average Marks:**

As regard the age group, it is observed that nearly 54 % belonged to age group of 16 to 30 and the growth of marks was16%. At the age group of 31 to 45, 45 % were from Indapur tahasil and there marks growth was17%. But 11 % respondent of Indapur belonged to the 46 to 60 age group and average marks was20 %. It clearly shows that most of farmers have good experience of the agricultural practices. Nearly 7 % farmers were from the age group of 60+ and there marks growth is 17%.

**AGE STRUCTURE OF RESPONDENTS AND AVERAGE MARKS**

| Age Group | 16-30 | 31-45 | 46-60 | 60+ | Total |
|---|---|---|---|---|---|
| No. Of Farmers | 54 | 45 | 13 | 8 | 120 |
| Percent | 45 | 38 | 11 | 7 | 100 |
| Pre Test Marks | 13.34 | 12.92 | 12.4 | 13.83 | - |
| Post Test Marks | 17.43 | 17.1 | 17.67 | 17.2 | - |
| Marks Growth in % | 16 | 17 | 20 | 17 | 100 |

Table No.1

**3. Education and Average Marks**:

From the point of education nearly 40.83 % of the farmers have secondary and 29.17% higher secondary education but only 3.33 % of the farmers have primary education. Nearly 26.67 % of the farmers have higher education i.e. graduates and post graduate. One respondent has a law degree and another has in engineering degree. In Indapur tahasils educational facilities are available since a long time. In this tahsil 17 % increase in marks from pre to post test of all the educational level except that of primary educated (only 16% growth) respondents, was recorded.

**EDUCATION AND AVERAGE MARKS**

| Education Level | Primary | Secondary | Hi. Second | Higher | Total |
|---|---|---|---|---|---|
| No. Of Farmers | 4 | 49 | 35 | 32 | 120 |
| Percent | 3.33 | 40.83 | 29.17 | 26.67 | 100 |
| Pre Test Marks | 9.8 | 13 | 13.2 | 14.3 | |
| Post Test Marks | 14.2 | 16.9 | 17.5 | 18.6 | |
| Marks Growth in % | 17 | 16 | 17 | 17 | |

Table No.2

4. **Land Holding Capacity:**

47 % of the farmers have a large land holding capacity, followed by 32 % and 21 % of the farmers having small and medium land holding capacity in the tahsil. Medium and Large Land Holding farmers got higher marks in pre to post tests. In Indapur tahsil 16.6 % increases marks of Large Land Holding Capacity farmers and 16 % increases marks of Medium Land Holding capacity farmers has been recorded.

**Land Holding Capacity**

| Land Holding | Small Area Up to -3 Acre | Medium Area 3.1 to 5 Acre. | Large Area above 5 Acre Land |
|---|---|---|---|
| No. of Farmers | 38 | 24 | 58 |
| Percentage | 32 | 21 | 47 |
| Pre Test | 13.3 | 13.3 | 13.7 |
| Post Test | 16.9 | 17.3 | 17.90 |
| Marks Growth in % | 14.5 | 16.0 | 16.6 |

Table No.3

## CLUSTER ANALYSIS:

The researcher is interested in clustering of villages in Indapur tahsil. 8 villages were selected for the experimental study and their pre and post test marks were considered for the cluster analysis, as shown below.

This is useful statistical method which is applied to divide or classify data in a meaningful group. Human beings are divided by skills, knowledge, age, income etc. separately but they could be grouped considering all these aspects. Cluster analysis is a technique of finding the classes of data. This analysis depends on the information found in the data and their relationship to another, or a different group.

## CLUSTER ANALYSIS OF VARIABLES:

**Clustering of various villages**

| clusters | C10 | C11 | C12 | C13 | C14 | C15 | C16 | C17 |
|---|---|---|---|---|---|---|---|---|
| Villages | Vadapuri | Nimgav Ketki | Kati | Redni | Lasurne | Bori | Anthurne | Sansar |

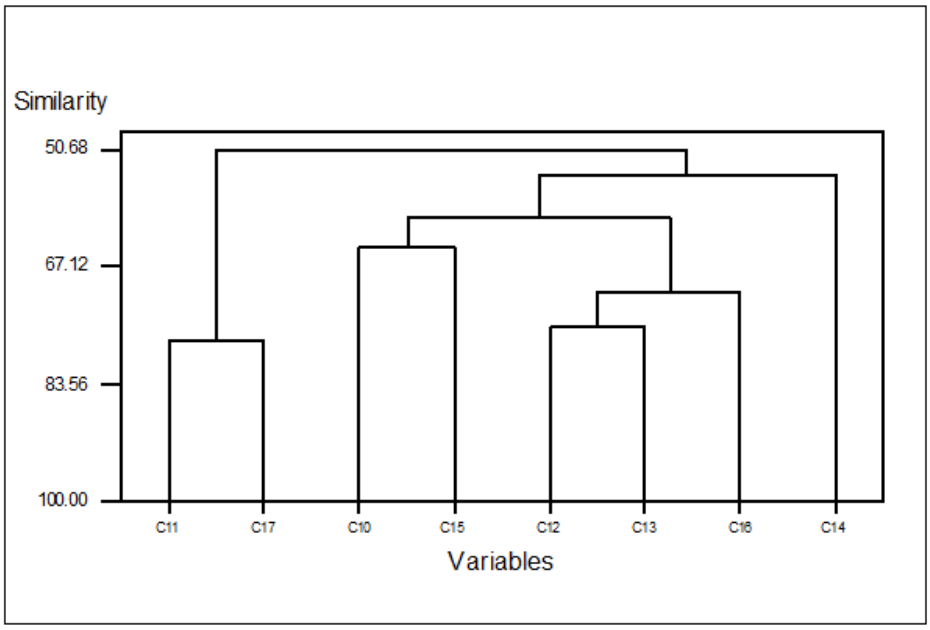
Table No.4

## CORRELATION COEFFICIENT DISTANCE, SINGLE LINKAGE AMALGAMATION STEPS

| Step | No. of Clusters | Similarity | Distance Level | Cluster Joined | | New Cluster | No. of Obs. in New Cluster |
|---|---|---|---|---|---|---|---|
| 1 | 7 | 77.53 | 0.449 | 2 | 8 | 2 | 2 |
| 2 | 6 | 75.52 | 0.49 | 3 | 4 | 3 | 2 |
| 3 | 5 | 70.63 | 0.587 | 3 | 7 | 3 | 3 |
| 4 | 4 | 64.37 | 0.713 | 1 | 6 | 1 | 2 |
| 5 | 3 | 60.32 | 0.794 | 1 | 3 | 1 | 5 |
| 6 | 2 | 54.31 | 0.914 | 1 | 5 | 1 | 6 |
| 7 | 1 | 50.68 | 0.986 | 1 | 2 | 1 | 8 |

Table No.5

## DENDROGRAM OF INDAPUR TAHSIL




Graph.1

## AS PER CLUSTER ANALYSIS FINAL PARTITION OF INDAPUR TAHSIL IS GIVEN AS FOLLOWS:
## FINAL PARTITION

| | | | | | | |
|---|---|---|---|---|---|---|
| Cluster I | C10 | C12 | C13 | C14 | C15 | C16 |
| Cluster II | C11 | C17 | | | | |

Table No.6

## COMMENTS:

Villages of Indapur tahsil are divided in 2 groups i.e. in first group **C10.** Nimgav. Ket., C12. Kati, C13. Redni, C14. Lasurne, C15. Bori and C16. Anthurne villages are included and in second group C11. Nimgaon Ketki and C17. Sansar villages are included. In these villages, growth of marks is seen to be influenced by the age and educational level of the farmers marks. The scores are increased by higher age and higher educational status.

The dendrogaram of Indapur tahsil (Graph.1) shows two separate villages with the provided variables. First two villages are grouped in one cluster and other seven villages are clustered in another group.

## CONCLUSION:

VCD is a 22 minute film in which soil testing importance was given on how to divide farm land to collect soil sample. To create awareness among farmers is the main purpose of VCD show. Actual soil sample collection, selecting representative soil sample from all collected soil, effect of deficiency of nutrients on crops, use of proper fertilizers for different crops are the topics of VCD to create awareness in the farmer community. Cluster analysis of Indapur tahsil shows that village Nimgav. K. and Sansar. They should watch VCD again and again. Marks score of primary educated farmers is seen to be very low in Indapur tahsil. Special attention should be given to these farmers about soil sample collecting knowledge. Marks score of farmers of 46 to 60 years age group is slightly lower than the other groups in both tahsils. So, VCD and GB

should be shown repeatedly to these farmers of the tahsils. All such age group farmers should read GB, observe VCD before a day and they should go for collecting a soil sample. Guidance Booklet and VCD should be prepared in local language (Mother tongue) which can be helpful to the other farmers of different regions.This study is conducted only in NLBC area of Indapur tahsil of Pune district. It needs more time, money and resources to conduct it on a large scale. But by its effectiveness it is recommended that this type of VCD show should be arranged covering Maharashtra state to increase agricultural productions.

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