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Development and Standardization of Audio-Visual Aid (Video) on Natural Farming for Farmers

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***Abstract*—** *New techniques and farm information need to reach farmers. Although there are a number of communication technologies available, video is the most effective medium to convey information in an attractive way and also effectively supports educational efforts. The present study aims to develop and standardize audio-visual aid on natural farming and find its effectiveness in generation of awareness about natural farming among farmers of Gujarat State. The prepared video film was of 18 minutes and 10 seconds duration. Names and acknowledgments were highlighted at the end of the visual script. The panel of twenty experts standardized the audio-visual aid on natural farming. Audio-visual aid was evaluated on a three-point scale i.e., most appropriate, appropriate, and not appropriate on 19 varied criteria which included audio, visual and overall presentation of audio-visual aid. The overall weighted mean score for audio aspect of audio-visual aid was found to be 2.77; the overall weighted mean score for visual aspect and presentation of audio-visual aid was found to be 2.82 each.*

Keywords*— *Development, Standardization, Audio-Visual Aid (Video), Natural Farming, Farmers.

I. INTRODUCTION

It is estimated that food production will need to increase by 60 per cent by 2050 for feeding the growing population (FAO, 2009). 'Natural Farming' or 'Eco-Agriculture' or 'Eco-Friendly Agriculture' is suggested as a neoteric approach to improve both traditional and modern agricultural practices, which aims to safeguard the environment, public health, and communities (Mishra, 2013). Natural Farming integrates the sustainable farm intensification practices with a focus on minimising the costs. Natural farming is based on 4 wheels/non-negotiable guidelines/principles or package of farming practices that would increase soil health and crop yields at zero external inputs or costs. These include: (i) Jiwamrita (life tonic); (ii) Bijamrita (seed protection tonic); (iii) Acchadana (mulching) and (iv) Vapasa (soil aeration/moisture) (Palekar, 2005; 2006; 2016; Devarinti, 2016; Bishnoi and Bhati, 2017 and Reddy, 2019). Video information is an ideal medium for awareness among farmers towards

new technologies and it helps in motivation and change in behaviour of the farmers. Many of the farmers explore books/online classes for the information and ideas in greater depth. Delivery of agricultural information via net publicity to the subjects offline disseminates farm statistics and thereby boosts one's information to the favoured expectancies (Vanetha, 2013). Understanding audiences' preference for receiving certain message types as well as factors such as consumer needs, moods, attitude or tastes helps to determine which media source to use (Webster & Ksiazek, 2012). Studies show that video is an effective medium for generating awareness (Bavishi, 2023), (Panasara, 2023). The message from videos reaches the mind of the audience through eyes and ears, thus motivating people for adoption of new technologies by changing their attitude (Pandian et al., 2002).

II. OBJECTIVES

1. To develop audio-visual aid on recommended natural farming
2. To standardize audio-visual aid on natural farming

III. METHODOLOGY

The present study was conducted in two phases:

3.1 Phase I: Development of Audio-Visual Aid on Recommended Natural Farming

Review related to natural farming was studied extensively and the content was framed. The various research articles and recommendations of natural farming were studied exhaustively. Based on the literature reviewed, audio-visual aid was developed for the study. The advice from extension officials and media development experts were incorporated to finalize the content. The content for enhancing awareness on natural farming were finalized for making audio-visual aid i.e., Introduction to Natural Farming, Preparation of Bijamrita, Preparation of Jiwamrita, Preparation of Dry Ghan-Jiwamrita, Preparation of Moist Ghan-Jiwamrita, Preparation of Acchadana (Mulching of soil surface), Preparation of Vapasa, Preparation of Neemastra, Preparation of Brahmastra, Preparation of Agnistra, Preparation of Sour Buttermilk (fungicide), Preparation of Dasparni ark and Conclusion.

3.1.1 Development of Audio-Visual Aid

The steps followed for the preparation of the audio-visual aid were: Planning, Scripting, Sequencing, Special effect, Story board, Reviewing, Recording, Video editing and Time estimation.

- **Planning:** It was planned to prepare audio-visual aid for farmers with objective to give them necessary information on natural farming. The dimensions of natural farming, sequencing and the learning assessments were done by expert advice.
- **Scripting:** Audio-visual aid script was prepared covering all the dimensions of natural farming.
- **Sequencing:** Logical outline was prepared, the sequencing of the subject matter was done to make the audio-visual aid informative and interesting.
- **Special effects:** To convey the idea effectively, special effects like computerized write-up, fade in and fade out, varied shots were decided upon and written in the script.
- **Story board:** After writing, story board was prepared. Storyboard consisted of graphics, illustrations displayed in sequence for purpose of pre-visualizing the content.

- **Review:** After completion of the audio-visual aid, it was reviewed by advisory committee members. Corrections were incorporated and content was modified until it was considered satisfactory by all the committee members.
- **Recording:** At recording stage, audio and visual elements described in the script were recorded. Audio and video clip for audio-visual aid was recorded in a soundless and echo-free chamber at multimedia laboratory of Department of Extension Education and Communication Management, ASPEE College of Nutrition and Community Science in Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat. According to requirement of the script the visual clips, i.e., both image/illustrations and video clips were recorded at research center, Center for Natural Resources Management, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat.
- **Video Editing:** According to the script, the visual scene was sequenced. So as to make the audio-visual aid educative and entertaining, editing and mixing was done by using Adobe Primer Pro software. Professional versions of these software were used. Editing and mixing was done so that audio could match the visuals. It was done at multimedia laboratory of Department of Extension Education and Communication Management, ASPEE College of Nutrition and Community Science in Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat. The following special effects were incorporated to make the audio-visual aid entertaining i.e., fade-in, fade-out, push-right, dashboard, push-left etc.
- **Time estimation:** The prepared video film was of 18 minutes and 10 seconds duration. Names and acknowledgments were highlighted at the end of the visual script.

TABLE 1
ESTIMATED DURATIONS OF AUDIO-VISUAL AIDS

Sr. No.	Audio-Visual Script	Duration
1	Introduction to Natural Farming	3 min 14 sec
2	Preparation of Bijamrita	1 min 16 sec
3	Preparation of Jiwamrita	2 min 11 sec
4	Preparation of Dry Ghan-Jiwamrita	1 min 72 sec
5	Preparation of Moist Ghan-Jiwamrita	1 min 21 sec
6	Preparation of Acchadana (Mulching of soil surface)	0 min 76 sec
7	Preparation of Vapasa	0 min 42 sec
8	Preparation of Neemastra	1 min 53 sec
9	Preparation of Brahmastra	1 min 20 sec
10	Preparation of Agnistra	1 min 21 sec
11	Preparation of Sour Buttermilk (fungicide)	1 min 01 sec
12	Preparation of Dasparni ark	2 min 18 sec
13	Conclusion	0 min 44 sec

3.2 Phase II: Standardization of Audio-Visual Aid on Natural Farming

The panel of twenty experts standardized the audio-visual aid on natural farming. Audio-visual aid was evaluated on a three-point scale i.e., most appropriate, appropriate, and not appropriate on 19 varied criteria. A detail description is given in table below:

TABLE 2

APPROPRIATENESS OF AUDIO-VISUAL AID BY EXPERTS ACCORDING TO EACH PARAMETER (n=20)

Sr. No.	Parameters	Overall Weighted Mean Score of Audio-Visual Aid
Audio Aspect of Audio-Visual Aid	Language	2.75
	Content clarity	2.65
	Sequence	2.95
	Clarity of voice	2.85
	Pace and speed	2.6
	Background music	2.8
	Interest orientation	2.85
	Understandability	2.7
Overall weighted mean score for Audio Aspect of Audio-Visual Aid		**2.77**
Visual Aspect of Audio-Visual Aid	Size of illustration	2.75
	Layout	2.95
	Colour	2.9
	Visual clarity	2.75
	Attention catching	2.7
	Continuity	2.85
Overall weighted mean score for Visual Aspect of Audio-Visual Aid		**2.82**
Overall Presentation of Audio-Visual Aid	Tuning of audio with visual	2.8
	Message treatment	2.95
	Self explanatory	2.95
	Speed of presentation	2.55
	Length of program	2.85
Overall weighted mean score for presentation of Audio-Visual Aid		**2.82**

The above Table 2 shows appropriateness of audio-visual aid by experts according to each parameter. The parameters of audio-visual aid consisted of three varied aspects i.e., audio aspect, visual aspect and overall presentation.

The weighted mean score range of all the aspects of audio-visual aid was found to be between 2.65 to 2.95. The highest weighted mean score was for the parameters i.e., "Sequence", "Layout", "Message treatment" and "Self explanatory" (2.95); followed by "Colour" i.e., (2.90) and the weighted mean score of 2.85 was obtained for "Clarity of voice", "Interest orientation", "Continuity" and "Length of program" of audio-visual aid.

Thus, it can be said that the prepared audio-visual aid follows proper continuation. The background music and tuning of audio with visual is such that it catches interest of the audience.

The overall weighted mean scores for the audio aspect, visual aspect, and presentation of the audio-visual aid were found to be 2.77, 2.82, and 2.82, respectively.

Similar findings were reported by Jain (2005) with a range of 2.43 to 2.67, Sharma (2009) with values between 2.86 and 2.89, Bavishi (2023) with a range of 2.80 to 2.83, and Panasara (2023) who reported a weighted mean score ranging from 2.70 to 2.80.

TABLE 3

DIMENSION WISE APPROPRIATENESS OF AUDIO-VISUAL AID FOR EACH PARAMETER BY EXPERTS (n=20)

Sr. No.	Dimensions/Parameters	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
Audio Aspect of Audio-Visual Aid	Language	2.7	2.65	2.85	2.75	2.8	2.95	2.8	2.7	2.9	2.75	2.95	2.9
	Content clarity	2.8	2.85	2.75	2.65	2.7	2.65	2.85	2.75	2.65	2.7	2.75	2.65
	Sequence	2.95	2.9	2.95	2.95	2.95	2.95	2.9	2.85	2.95	2.85	2.95	2.9
	Clarity of voice	2.85	2.8	2.85	2.8	2.9	2.85	2.85	2.8	2.9	2.8	2.85	2.8
	Pace and speed	2.65	2.7	2.65	2.6	2.65	2.75	2.6	2.7	2.8	2.65	2.7	2.75
	Background music	2.8	2.75	2.75	2.8	2.75	2.8	2.85	2.9	2.85	2.75	2.9	2.95
	Interest orientation	2.85	2.8	2.85	2.85	2.8	2.85	2.9	2.85	2.8	2.85	2.95	2.85
	Understandability	2.75	2.65	2.85	2.7	2.7	2.7	2.75	2.8	2.85	2.7	2.75	2.7
Visual Aspect of Audio-Visual Aid	Size of illustration	2.8	2.7	2.8	2.75	2.75	2.75	2.8	2.7	2.75	2.8	2.85	2.9
	Layout	2.9	2.85	2.95	2.95	2.8	2.95	3	2.95	2.9	2.95	2.95	2.85
	Colour	2.9	2.95	2.9	2.9	2.95	2.9	2.95	2.9	2.85	2.8	2.8	2.9
	Visual clarity	2.75	2.7	2.75	2.75	2.8	2.75	2.8	2.85	2.75	2.75	2.85	2.75
	Attention catching	2.7	2.75	2.75	2.65	2.75	2.7	2.75	2.8	2.7	2.8	2.7	2.85
	Continuity	2.85	2.7	2.85	2.85	2.85	2.85	2.9	2.85	2.9	2.85	2.8	2.9
Overall Presentation of Audio-Visual Aid	Tuning of audio with visual	2.8	2.75	2.8	2.85	2.8	2.8	2.8	2.75	2.8	2.8	2.85	2.8
	Message treatment	2.95	2.85	2.95	2.9	2.95	2.95	2.95	3	2.95	2.9	2.8	3
	Self explanatory	2.95	2.9	2.95	2.95	2.85	3	2.95	2.95	2.9	2.95	2.9	2.95
	Speed of presentation	2.55	2.65	2.55	2.55	2.7	2.55	2.55	2.75	2.8	2.7	2.95	2.7
	Length of program	2.85	2.9	2.85	2.85	2.9	2.9	2.85	2.8	2.9	2.75	2.85	2.95
Overall appropriateness of audio-visual aid		**2.81**	**2.78**	**2.82**	**2.79**	**2.81**	**2.82**	**2.83**	**2.81**	**2.84**	**2.79**	**2.85**	**2.84**

(Note: D1 to D12 refer to the 12 dimensions of natural farming listed in Table 1)

Weighted mean score for audio aspect of audio-visual aid was found to be 2.65 to 2.95. The overall weighted mean score for visual aspect of audio-visual aid was 2.65 to 3.00 and the overall weighted mean score for presentation of audio-visual aid was found to be 2.55 to 3.00.

3.3 Difference in Gain in Awareness when Audio-Visual Aid is Used Among Varied Dimensions

To find out whether there is any difference in gain in awareness when different dimensions of audio-visual aid are used, the data were analysed as per method of Complete Randomised Design (CRD).

TABLE 4

ANOVA FOR GAIN IN AWARENESS OF VARIED DIMENSIONS OF AUDIO-VISUAL AID

Treatments	Mean ($\bar{X}$ + S.D.)	Significance
D1	29.517f + 1.0823	P<0.01
D2	43.538d + 2.0059	P<0.01
D3	46.025c + 1.9597	P<0.01
D4	47.388b + 1.1839	P<0.01
D5	61.446a + 2.1270	P<0.01
D6	28.150h + 1.2419	P<0.01
D7	28.804g + 1.3062	P<0.01
D8	23.988j + 0.6627	P<0.01
D9	23.283k + 1.3641	P<0.01
D10	26.238i + 1.2634	P<0.01
D11	17.767l + 0.5524	P<0.01
D12	37.942e + 1.4452	P<0.01
S.Em	0.412475	
C.D. (P=0.05)	1.04531	
CV% =	4.140772	

***** = Highly significant at less than 0.0001***

(Note: D1 to D12 refer to the 12 dimensions of natural farming listed in Table 1)

The analysis given in Table 4 showed that the test was found to be highly significant. The data indicates that there was significant difference in gain in awareness level among the farmers who were exposed to varied dimensions of audio-visual aid.

Preparation of Moist Ghan-Jiwamrita (D5) was found to be the most favored dimension with a total score of 61.446, followed by Preparation of Dry Ghan-Jiwamrita (D4) (47.388) and Preparation of Jiwamrita (D3) (46.025). On the other hand, Preparation of Sour Buttermilk (fungicide) (D11) (17.767), Preparation of Brahmastra (D9) (23.283), Preparation of Neemastra (D8) (23.988), Preparation of Agnistra (D10) (26.238), Preparation of Acchadana (Mulching of soil surface) (D6) (28.150), Preparation of Vapasa (D7) (28.804), Introduction to Natural Farming (D1) (29.517), Preparation of Dasparni ark (D12) (37.942), Preparation of Bijamrita (D2) (43.538), Preparation of Jiwamrita (D3) (46.025), Preparation of Dry Ghan-Jiwamrita (D4) (47.388) and Preparation of Moist Ghan-Jiwamrita (D5) (61.446) were in increasing order of preference.

3.4 Ranking of Different Dimensions of Audio-Visual Aid Best for Increasing Awareness

In order to find out which different dimension of audio-visual aid is best for increasing awareness level among rural farmers regarding natural farming, percentage on the basis of scores obtained were computed and compared. Rank was given accordingly.

TABLE 5

RANKING OF DIFFERENT DIMENSIONS OF AUDIO-VISUAL AID ON THE BASIS OF GAIN IN AWARENESS

Sr. No.	Different Dimensions of Audio-Visual Aid	Score	Per cent	Rank
1	Preparation of Bijamrita	10449/10800	96.75	VIII
2	Preparation of Jiwamrita	11046/11520	95.89	X
3	Preparation of Dry Ghan-Jiwamrita	11373/11520	98.72	II
4	Preparation of Moist Ghan-Jiwamrita	14747/15120	97.53	IV
5	Preparation of Acchadana (Mulching of soil surface)	6756/7200	93.83	XI
6	Preparation of Vapasa	6913/7200	96.01	IX
7	Preparation of Neemastra	5757/5760	99.95	I
8	Preparation of Brahmastra	5588/5760	97.01	VII
9	Preparation of Agnistra	6297/6480	97.18	VI
10	Preparation of Sour Buttermilk (fungicide)	4264/4320	98.7	III
11	Preparation of Dasparni ark	9106/9360	97.29	V

Ranking of different dimensions of audio-visual aid on the basis of gain in awareness level among farmers regarding natural farming were obtained and it was found that dimension Neemastra was ranked first, followed by Dry Ghan-Jiwamrita, Sour Buttermilk and then Moist Ghan-Jiwamrita.

It means, when Neemastra was used, there is maximum gain (mean=99.95) in awareness level. The reason could be that our Vedas have already described the significance of neem leaves, which is why farmers became quickly aware of the formulation of Neemastra.

Followed by Dry Ghan-Jiwamrita, the gain in awareness level is high (mean=98.72) in comparison to Sour Buttermilk (mean=98.70). The fourth and fifth ranks were occupied by preparation of Moist Ghan-Jiwamrita (mean=97.53) and preparation of Dasparni ark (mean=97.29) respectively. Similarly, preparation of Agnistra (mean=97.18), preparation of Brahmastra (mean=97.01), and preparation of Bijamrita (mean=96.75) also secured higher positions in the ranking. On the other hand, preparation of Vapasa with (mean=96.01) was ranked nine, followed by preparation of Jiwamrita with (mean=95.89) placed at tenth rank, whereas the lowest score was recorded in preparation of Acchadana (mulching of soil surface) showing (mean=93.83) and thereby securing the eleventh rank. This clearly indicates that farmers found the preparation of Neemastra most effective and appealing, while Acchadana was perceived as the least effective dimension of the audio-visual aid.

IV. CONCLUSION

It can be concluded that audio-visual aid can be effectively utilized as a key method to enhance awareness regarding natural farming practices and experiences. By combining visual and auditory elements, these aids provide clear, engaging, and easily understandable information, which is particularly beneficial for reaching farmers with diverse educational backgrounds. Consequently, incorporating audio-visual aids into agricultural extension programs can play a vital role in improving knowledge dissemination, promoting sustainable farming methods, and empowering farmers to adopt natural farming techniques more confidently and effectively

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research paper.

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