

	<h2 style="color: blue;">Indian Research Journal of Extension Education</h2> <p style="color: red;">ISSN: 0972-2181 (Print), 0976-1071 (Online)</p> <p>NAAS Rating : 5.22</p> <p>Journal homepage: seea.org.in</p>	
Research Article https://doi.org/10.54986/irjee/2022/jan_mar/13-18		

A Scale to Measure the Attitude of Farmers Towards Natural Farming

P. H. Zala¹ and B.N. Kalsariya²

1. Ph. D. Scholar (Agril. Ext.), CoA, JAU, Junagadh, Gujrat, 2. Asso.Prof., Polytechnic in Agriculture, JAU, Sidsar, Junagadh, Gujrat (India)

Corresponding author e-mail : zalaprashant7@gmail.com

Paper Received on August 18, 2021, Accepted on November 02, 2021 and Published Online on January 01, 2022

ABSTRACT

Attitude is defined as the degree of encouraging or depressing feeling of the farmers towards natural farming. Attitude is a way of thinking, acting or feeling of a person towards a situation or cause. It is the accepted fact that an attitude of an individual plays an important role in determining one's behaviour. Keeping this in view, a standardized scale had been developed to measure the attitude of farmers towards natural farming. A summated (likert) rating scale had been developed. The process started with identifying the dimension, collection of items followed by relevancy and item analysis, checking the reliability and validity for precision and consistency of the results. A total of 45 statements were framed and in which, 19 statements had finally retained which has practical applicability in measuring the attitude of farmers towards natural farming. The scale was containing a total of nineteen statements, out of which thirteen are positive and six statements are negative. The split half method developed by Brown Prophecy was employed to measure the reliability. The reliability coefficient (0.79) and content validity also worked, indicating higher reliability and validity of the scale. Hence, the same would be used elsewhere by any investigator.

Key words: Attitude; Farmers; Natural farming; Scale product method.

The worlds population increase day by day, it is estimated that food production will need to increase by 60 per cent by 2050 (FAO, 2009). This increasing food demand is promoting farmers worldwide to increase crop production, which builds pressure on the environment and exceeds it carrying capacity to repair or replace itself, leading to its serious degradation. 'Natural Farming' 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 is not a technique but a view, or a way of seeing

ourselves as a part of nature, rather than separate from or above it. It is also referred to as "the Fukuoka Method", "the natural way of farming" or "do-nothing farming". The title refers not to lack of effort, but the avoidance of manufactured inputs and equipment. Natural farming aims to increase farmer's yield by maximizing production factors (labour, soil, equipment) and by avoiding the use of non-natural inputs (fertilizers, herbicides and pesticides) to optimize production potential and thus provide abundantly, high quality, healthy food at the best price. The golden rule is to enrich the level of organic matter into the soil, which supports microbial

life, and therefore increase the soil's fertility.

Attitude is the degree of positive or negative affect with some psychological objects like symbol, phrase, slogan, person, institutions, ideas towards which people can differ in varying degrees from the point of view of social psychology. In the present study, an attempt has been made to develop a scale that can scientifically measure the attitude of farmers towards natural farming. Among the techniques available for the construction of the scales, *Thurstone's Equal Appearing Interval Scale (1928)* and *Likert's Summated Rating Scale (1932)* are quite well known. Both the methods suffer from limitations, the first one in getting the discriminating response and the second one in the selection of items.

Thus, the technique chosen to construct the attitude scale was of "Scale Product Method" which is a combination of Thurstone's technique of equal appearing interval scale for selection of the items and Likert's technique of summated rating for ascertaining the response on the scale as proposed by *Eysenck and Crown (1949)*. A similar procedure was also followed by *Chandra and Kumar (2007)*, *Netravathia and Chauhan (2014)* and *Chauhan and Patel (2020)*. The following procedure was applied to develop the scale. In the present study, attitude referred to the degree of positive or negative affect associated with adopted and non-adopted farmers towards natural farming. Keeping this in view the present study was designed to develop and standardize the scale to measure the attitude of farmers towards natural farming.

METHODOLOGY

Selection of statements : The items making up an attitude scale are known as statements. A statement may be defined as anything that is said about a psychological object. As a first step in developing the scale, 64 statements were collected from the relevant literature, major advisor, extension educationists and experts from Junagadh Agricultural University and Anand Agricultural University. The statements, thus selected, were edited on basis of the criteria suggested by *Thurstone and Chave (1928)*, *Wang (1932)*, *Likert (1932)* and *Edward and Kilpatrick (1948)* and at last, 45 statements were selected as they were found to be non-ambiguous.

Judges rating on attitudinal statements : Total seventy slips of these statements were sent through e-mail and

WhatsApp number of 70 judges selected. The judges were provided with a letter of instructions to guide them in rating the statements in the desired manner as seen in Appendix-I. The judges selected for the study comprised extension educationists and experts of different faculties from various universities of India. To judges were asked to judge the degree of "Unfavourableness" to "Favourableness" of each statement on the five-point equal appearing interval continuum, a panel of 70 selected judges. Out of seventy experts, 50 experts were returned the statements after duly recording their judgments and considered for analysis.

Determination of scale and quartile value : The five points of the rating scale were assigned score ranging from 1 for most unfavourable and 5 for most favourable. Based on judgment, the median value of the distribution and the quartile (Q) value for the statement concerned were calculated. The inter-quartile range $Q = (Q_3 \text{ or } C_{75} - Q_1 \text{ or } C_{25})$ for each statement was also worked out for the determination of ambiguity involved in the statement.

$$S = L + \frac{0.50 - \Sigma pb}{Pw} \times i$$

Where,

S = Median or Scale value of statement

L = Lower limit of the interval in which the median falls

Spb = Sum of the proportion below the interval in which the median falls

Pw = Proportion within the interval in which the median falls

i = Width of the interval which was assumed as equal to 1.

Thurstone and Chave (*Edwards, 1957*) used the inter-quartile range Q as a means of the variation of the distribution of the judgments for a given statement. To determine the value of Q, two other values viz., the 75th centile and 25th centile values were also measured. The 25th centile was obtained by the following formula. The 75th centile was obtained by the formula.

$$C_{25} = L + \frac{0.25 - \Sigma pb}{Pw} \times i$$

Where,

Spb = Sum of

C₂₅ = Median or scale value of the statement

L = Lower limit of the interval in which the 25th centile falls

Spb = Sum of the proportion below the interval in which the 25th centile falls

Pw = Proportion within the interval in which the 25th centile falls

i = Width of the interval and is assumed to be equal to 1.0.

The 75th centile was obtained by the following formula.

$$C_{75} = L + \frac{0.75 - \Sigma pb}{Pw} \times i$$

Where,

C_{75} = Median or scale value of the statement

L = Lower limit of the interval in which the 75th centile falls

Σpb = Sum of the proportion below the interval in which the 75th centile falls

Pw = Proportion within the interval in which the 75th centile falls

i = Width of the interval and is assumed to be equal to 1.

In the first stage of the selection, only those statements were selected whose median values were greater than Q value. *Thurstone and Chave (Edwards, 1957)* described another criterion in addition to Q as a basis for rejecting statements in scales constructed by the method of the equal appearing interval. Accordingly, when a few statements had the same scale values, the statement having the lowest Q value was selected.

The final statement for attitude scale : When there was a good agreement among the judges in judging the degree of agreement or disagreement of a statement, Q value comes smaller as compared to the scale value obtained. Finally, the statements whose median (scale) values were observed greater than Q values were selected. However, when a few statements had the same scale values, statements having the lowest Q value are selected. Based on the median and Q values, the following statements (Table 2) were finally selected to constitute the attitude scale.

Method of scoring : The selected 19 statements for the final format of the attitude scale were randomly arranged to avoid the response biases, which might contribute to low reliability and detract from the validity of the scale. Out of the 19 selected statements, thirteen statements were the indicators of the positive attitude and six statements were the indicators of negative attitude.

Against these 19 statements, there were five columns representing five points continuum of agreement and disagreement to the statements as followed by *Likert (1932)* in his summated rating technique to measure attitude. The five points continua were strongly agreed, agree, undecided, disagree and strongly disagree with respective weights of 5, 4, 3, 2, and 1 for the favourable statements and with the respective weights of 1, 2, 3, 4 and 5 for the unfavourable statements. The total attitude score for each farmer was obtained by adding all the scores of their responses

of all the statements.

Reliability of the scale : A scale is reliable when it consistently produces the same results when applied to the same sample. In the present study, a split-half method of testing reliability was used. The 19 statements were divided into two halves with ten odds numbered in one half and the other nine even-numbered statements in the other part. These were administered to 20 farmers. Each of the two sets of statements was treated as a separate scale and then these two subscales were correlated. The coefficient of reliability was calculated by Rulon's formula (*Guilford, 1954*), which came to 0.79. Thus, the scale developed was found highly reliable.

The coefficient of reliability was calculated by the following Rulon's formula.

$$rtt = 1 - \frac{\sigma^2 d}{\sigma^2 t} \quad \sigma^2 t = \frac{\Sigma t^2 - \frac{(\Sigma t)^2}{n}}{n}$$

Where,

rtt = coefficient of reliability

$\sigma^2 d$ = variance of these differences

$\sigma^2 t$ = variance of total score

Content validity of the scale : The validity of the scale was examined for content validity by determining how well contents are selected by discussing it with specialists of extension and academicians of Junagadh Agricultural University. The content of the scale was realized applicable to measure the attitude of farmers towards natural farming as an occupation by the experts. Thus, the present scale satisfied the content validity.

Administering the scale : The final attitude scale consisting of 19 statements was administered on the sample of farmers to measure their attitude towards natural farming. They were asked to express their reaction in terms of their agreement or disagreement with each item by selecting one of five response categories viz. strongly agree, agree, undecided, disagree and strongly disagree. For positive statements scores of 5, 4, 3, 2 and 1 were given for strongly agree, agree, undecided, disagree and strongly disagree responses respectively. The scoring was reverse in case of negative statements.

CONCLUSION

From the various methods available for constructing the attitude scale, 'scale product method' which combines the Thurstone's technique of equal appearing

Table 1. Method of selecting the statements for the scale based on scale value and inter-quartile range

Statement	S value	Q value
I am sure that soil testing is not required in natural farming. (+)	3.62	2.467*
I think that only big land holder can adopt natural farming. (-)	3.62	2.215**
I believe natural farming does reduce production. (-)	3.00	1.997**
In my view, Purchasing and maintaining traditional/indigenous cows is difficult. (-)	3.00	2.333*
I think natural farming practices of crop protection are not effective. (-)	3.00	2.441*
I feel natural farming is a tedious job. (-)	2.70	2.121*
In my opinion, irrigation requirement decrease in natural farming so, water and electricity both can be saved. (+)	2.70	1.769**
I believe crop with high nutrient uptake cannot be grown in natural farming. (-)	2.50	2.081*
I think natural farming practices are labour intensive hence, costly. (-)	2.50	2.143*
I don't like that natural farming increases weed infestation. (-)	2.50	2.071**
I prefer natural farming because it is complementary to other farm enterprises. (+)	2.32	2.049**
Monoculture is not suitable under natural farming. (-)	2.32	2.139*
I think farmers are less aware about natural farming. (-)	2.32	2.161*
I think farmer has more leisure time compared to other farmers in Natural farming. (-)	2.25	1.813*
In my view, application of crop residues and mulching promotes aeration and water retention in the soil. (+)	2.25	1.625**
I would like that natural farming is a pain free, care free and loan free farming. (+)	2.20	1.976**
I prefer to use of Nimastra, Brahmastra, Agni Astra, Dashparni ark for control of sucking pest and all type of larva. (+)	2.16	1.229**
Research based recommendations are not available at present for natural farming. (-)	2.16	1.892*
I believe that one cow can sustain farming on more than 5 acres land. (+)	2.11	1.607**
I think disease management practices are complex in natural farming. (-)	2.07	1.857*
I think plant grown naturally is not more tolerant to insects and disease as compared to other farming practices. (-)	2.07	1.154**
I would like to advise my children to use of Bijamrut for seed treatment to protect from soil born disease and Jivamrut is best source of all nutrients. (+)	2.00	1.101**
I feel that farmers are suffering to sell their product of natural farming in market.	1.97	1.207*
I believe natural farming is complementary to other farm enterprises.	1.97	1.238*
I am sure that natural farming reduces the incidence of non-communicable diseases such as acute and chronic neurotoxicity, respiratory diseases and even cancer. (+)	1.97	1.179**
I think natural farming is the only alternate to remove ill effects of chemicals. (+)	1.86	1.606*
In my view natural farming includes easy practices. (+)	1.86	1.079*
Natural farming improves resource efficiency in consumption and production and decouple growth from environmental degradation. (+)	1.86	0.970*
I think natural farming promotes mixed farming. (+)	1.86	1.234*
I believe that natural farming through sustainable management and efficient use of natural resources is possible. (+)	1.86	0.960*
I think to stop the use of chemical fertilizers is not easy for farmers. (-)	1.8	1.234*
I think nutrient deficiency disorders are common during the initial years of natural farming.	1.8	1.156*
I feel that using neem leaf or kernels extract to most effective for pest control. (+)	1.8	1.153**
I don't trust that natural farming are best remedy from global warming. (-)	1.76	1.183**
Hybrid seeds requires more fertilizer, more water and also creates health related problems as compare to desi seeds (indigenous seeds). (-)	1.76	1.296*
I strongly favour natural farming does not depend on heavy machinery. (+)	1.75	1.250*
In my view, natural farming might reduce input cost because farmer do not need to take anything from outside. (+)	1.75	1.082**

I believe natural farming keeps the soil porous and in-situ condition. (+)	1.75	1.136*
Natural farming decrease the per centage of organic carbon in soil. (-)	1.68	1.155**
I think farmer get high prices of their product due to it has opened new export avenues. (+)	1.58	1.087*
I think natural farming improves the quality of foodstuff. (+)	1.58	1.100*
I believe natural farming protects beneficial insects to overcome the problems of plant protection measure. (+)	1.58	1.235*
I think natural farming reduces cost of cultivation. (+)	1.36	1.155*
I accept that natural farming conserves the beneficial organisms and microbes in soil and also increases soil fertility. (+)	1.36	1.016**
I feel natural farming is helpful to keep the earth eco-friendly and conserve biodiversity. (+)	1.36	1.041**

*Not selected; **Selected

Table 2. Final selected statements for the scale to measure attitude of farmers towards natural farming

Statements	SA	A	UD	DA	SDA
In my view, natural farming might reduce input cost because farmer do not need to take anything from outside. (+)					
I don't trust that natural farming are best remedy from global warming. (-)					
I believe natural farming does reduce production. (-)					
In my view, application of crop residues and mulching promotes aeration and water retention in the soil. (+)					
In my opinion, irrigation requirement decrease in natural farming so, water and electricity both can be saved. (+)					
I prefer natural farming because it is complementary to other farm enterprises. (+)					
I think farmer get high prices of their product due to it has opened new export avenues. (+)					
Natural farming decreases the per centage of organic carbon in soil. (-)					
I think plant grown naturally is not more tolerant to insects and disease as compared to other farming practices. (-)					
I would like to advise my children to use of Bijamrut for seed treatment to protect from soil born disease and Jivamrut is best source of all nutrients. (+)					
I prefer to use of Nimastra, Brahmastra, Agni astra, Dashparni ark for control of sucking pest and all type of larva. (+)					
I feel that using neem leaf or kernels extract to most effective for pest control. (+)					
I accept that natural farming conserves the beneficial organisms and microbes in soil and also increases soil fertility. (+)					
I believe that natural farming through sustainable management and efficient use of natural resources is possible. (+)					
I am sure that natural farming reduces the incidence of non-communicable diseases such as acute and chronic neurotoxicity, respiratory diseases and even cancer. (+)					
I believe that one cow can sustain farming on more than 5 acres land. (+)					
I would like that natural farming is a pain free, care free and loan free farming. (+)					
I think that only big land holder can adopt natural farming. (-)					
I don't like that natural farming increases weed infestation. (-)					

interval scale, for selection of items and Likert's technique of summated rating for ascertaining the response on the scale as proposed by Eysenck and Crown was used to measure the attitude of farmers towards natural farming. The attitude scale developed was found to be reliable and valid. Hence, it can be concluded that the scale developed was useful in

measuring the attitude towards natural farming. Hence, researchers can use this scale in future for measuring the attitude of farmers in the similar studies.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

- Chandra, N. and Kumar, S. (2007). A scale to measure farmers' attitude towards improved agricultural practices. *Indian Res. J. Ext. Edu.*, **7** (2&3): 30-31
- Chauhan, C.D. and Patel, J.B. (2020). A scale to measure the attitude of member farmers of gram panchayat towards Pradhan Mantri Fasal Bima Yojana. *Guj. J. Ext. Edu.*, **31** (1): 1-5.
- Edwards, A.L. (1957). Techniques of attitude scale construction. Appleton Century Inc., New York.
- Edwards, A.L. and Kilpatrick, F.P. (1948). A technique for the construction of attitude scale. *J. of Appl. Psycho.*, **32** (4): 374-384.
- Eysenck, H. J. and Crown, S. (1949). An experimental study in opinion attitude methodology. *Intl.J. of Attitude Res.*, **3**: 47-86.
- Food and Agriculture Organization-FAO (2009). How to feed the world: Global agriculture towards 2050. High Level Expert Forum, Food and Agriculture Organization. Retrieved from www.fao.org; on 27/12/2020.
- Guilford, J.P. (1954). Psychometric methods. New York: McGraw Hill Book Co. Inc., 377.
- Likert, R.A. (1932). A Technique for the measurement of attitudes. *Archives of Psycho.*, **140**: 43-55.
- Mishra, M. (2013). Role of Eco-friendly agricultural practices in Indian agriculture development. *Intl. J. of Agri. and Food Sci. Tech. (IJAFST)*, **4** (2) : 25-29.
- Netravathia, G. and Chauhan, N.B. (2014). A scale to measure attitude of research scholars towards climate change studying in agricultural universities. *Indian Res. J. Ext. Edu.*, **14** (1) : 83-86
- Thurstone, L.L. and Chave, E.G. (1928). The measurement of opinion. *J. Abnormal Social Psycho.*, **22** : 415-430.
- Wang, K.A. (1932). Suggested criteria for writing attitude statements. *J. Social Psycho.*, **3**: 367-373.

