A Resilience scale to Measure Farmers' Suicidal Tendencies in National Calamity Hit Region of India

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ABSTRACT

Agriculture is the backbone of India as it provides employment to half of its populace. But in present scenario, it is facing numerous challenges, viz., unfair and non-remunerative price of the produce, unstructured market and supply chain, crop failure etc. But one of the alarming trend shows that farmers in our country wants to quit agriculture in mass extent and are committing suicide; that is a threat to our sustainable development. In this direction, the research was designed with the objective of developing a scale to measure resilience in relation to farmers' life (RFL-Scale) in order to know the suicidal tendencies among the farmers. Therefore, the present study made an attempt to quantify the exact level of resilience, with the specific objective to develop and standardize a scale to measure resilience level of the farmers' towards their life in national calamity hit region of India. The process started with selection of 54 statements and finally lists of 33 statements indicating the positive or negative resilience level were retained for scale development. The statements were edited in the light of the informal criteria suggested by Edwards. The total individual score of judges was calculated by summing up the weights given by judges to the individual statement. In order to find out the discriminating index for each item, 't' value was calculated using the formula and procedure given by Edwards. The scale so developed finally consisted of 18 statements. The scale can be used world-wide by research scholars, policy makers, governmental organizations, NGOs, scientists and civil societies to know the suicidal tendencies with suitable time, location and profession specific modifications.

Key words: Farmers' Suicide, Flood, Distress hotspots, Kosi, Cronbach's alpha.

INTRODUCTION

India is the land of agriculture and it is the main source of livelihood among the farming community from the pre-historic time and still approximately 50 percent of our population is directly dependent on agriculture[1]. But, the recent trends in agriculture and allied sectors are showing some depressing pictures. The share of agriculture and allied sectors in India's GDP has declined to 13.7 percent in 2012-13 from 51.9 percent in 1950-51[2]. The reason given to this decline by ex-minister of State for Agriculture, in a written reply to the Rajya Sabha was due to shift from traditional agrarian economy to industry and service sectors[2]. There is some fact in the statement, but we can't ignore the fact that the living condition of majority of farmers in our country is pitiable to such an extent that a large number of farmers in India are compelled to commit suicide and are at the verge to quit farming than to live in a miserable livelihood conditions. Today, India is world's suicide capital with a suicide in every 2 minutes and has highest number of suicides in the world: WHO[3,4]. Indian youth most frustrated: WHO, as India has highest rate of suicide among young people in whole world, aged between 15 to 29 years,

with 35.5 suicides/lakh of populations [3]. Moreover, Suicides as a whole rose nationally in the 1997-2005 period, but the rate of increase in farm suicides was far higher than the rate of increase in suicides by non-farmers and in 2011 alone suicide rates among Indian farmers were a chilling 47 percent higher than they were for the rest of the population[5].

There are several "distress hotspots" in India, where farmers are committing suicide or want to quit farming[6]. It has been recorded that distressed hotspots are those where farmers had faced crop failure due to several reasons including natural calamities. Those distressed hotspots have been identified in the country like: Kosi region of Bihar where farmers are quitting farming and becoming laborer due to concurrent flood and drought in the region; southern Punjab's Sangrur and Bhatinda district, Bundelkhand region in Uttar Pradesh, Vidharba region in Maharashtra, where farmers' are committing suicide. A report by the Tata Institute of Social Sciences, Mumbai identified the reasons for farmer's suicides: repeated crop failures, inability to meet the rising cost of cultivation, and debt[7]. Therefore, it is essential to find suitable tool which can measure the reasons of their disinterest in agriculture and for taking the extreme step like suicide in the past few decades. So, a scale was devised to measure the suicidal tendencies of the farmers in one of the 'distress hotspots' of India i.e. the Kosi region, in order to know whether they are more inclined towards PTSD or PTG. The Kosi flood, which affected Bihar in 2008, was declared as "National Calamity" by ex-Prime Minister of India, Dr. Manmohan Singh and so far, it is the single calamity in the history of India to be officially declared as a 'National Calamity'[8]. The region was selected for the study because 'true resilience' can only be measured in 'post-traumatic condition'.

It will be worth mentioning that, by passing through any post traumatic event, the subject may shift to either side of the continuum i.e. post traumatic stress disorder (PTSD is undesirable because in advance state it may lead to depression or suicide) to post traumatic growth (PTG is desirable because in this the subject become more resilient than before). So, resilience in relation to farmers' life scale (RFL-Scale) was constructed to know the

reason why farmers are committing suicide or what motivates them to cope up in their life despite of numerous hardships. Lesser the score in resilience scale more will be the suicidal tendency and vice versa. So, scale is capable of measuring both the extreme of the continuum based on scores of the individual in the scale. Earlier 'resilience scales' were constructed to measure midlife crisis in men and women[9] and to measure resiliency level in students and United States Army, as students and war personnel are prone to depression and suicide in US[10]. There are indications that for each adult who died of suicide there may have been more than 20 others attempting suicide: WHO[3]. That means out of 20 suicides attempt only one is successful attempt and it implies that suicidal tendencies are more severe than the suicide itself. So, RFL-scale is meant to record the suicidal tendencies well in advance, so that essential measures can be taken before someone commits suicide. It must be taken into consideration that no single 'resilience scale' can be used 'as such' to measure the resiliency level of farmers countrywide due to time and location specific constraints. So, the RFL-Scale can be used by future researchers with suitable modifications in the other distressed hotspots of India.

MATERIALS AND METHODS

The word resilience had Latin origin in 1620-30; Latin resili ($\bar{e}$ns), present participle of resilire to spring back, rebound (see resil$\bar{i}$ent) + -ence. Resilience is a dynamic process in which the individual displays positive adaptive skills despite experiencing significant traumatic adversity. Resilience in this study was operationalized as the degree to which farmers bounced back in relation to their life after the national calamity. The method of summated rating suggested by Likert (1932) [11] was followed in the development of scale. The following steps were considered for measuring resilience of the farmers in relation to their life.

Collection of statements: The first step in the construction of resilience scale was to collect statements pertaining to the resilience in relation to life. Utmost care was taken to include equal number of positive and negative statements in the list to reduce the effects of social desirability and

positive response bias. Editing the statements: These statements were edited as per the 14 informal criteria enunciated by Edwards (1969)[12]. Out of 54 statements, 33 statements were retained after editing.

Response to raw statements: The pro forma containing raw statements on three point continuums i.e. Agree (A), Undecided (UD), Disagree (DA) were mailed by post, e-mail and also handed over personally to 75 judges. Out of 75 judges 60 judges from 30 different institutes provided the response. Item analysis: The judges were asked to indicate their degree of response with each statement on three point continuum ranging from Agree (A), Undecided (UD) and Disagree (DA) with scoring of 3, 2, and 1; for positive statement and the scoring pattern was reversed i.e. 1, 2, and 3 for negative statement.

Calculation of 't' values: Based upon the total individual scores, the judges score were arranged in descending order. The top 25 percent of judges with their total individual scores were considered as high group and bottom 25 percent as the low group. The 't' values were worked out in order to discriminate the responses of high and low groups for the individual statements by using the under mentioned formula (Edwards, 1969)[13]. Thus, out of 60 judges, 15 judges with highest and 15 judges with lowest scores were used as criterion groups to evaluate individual statement.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\dfrac{\sum_{i=1}^{n}(X_H - \bar{X}_H)^2 + \sum_{i=1}^{n}(X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where, $\sum (X_H - \bar{X}_H)^2 = \sum X_H{}^2 - \dfrac{(\sum X_H)^2}{n}$

$\bar{X}_H$ = The mean score on a given statement for the high group

$\bar{X}_L$ = The mean score on a given statement for the low group

$\sum X_H{}^2$ = Sum of squares of the individual score on a given statement for high group

$\sum X_L{}^2$ = Sum of squares of the individual score on a given statement for low group

$\sum X_H$ = Summation of scores on given statement for high group

$\sum X_L$ = Summation of scores on given statement for low group

n = Number of subject in low and high group

t = The extent to which a given statement differentiate between the high and low group.

Example: Statement-1: I always hope for the best while being mentally prepared for the worst.

The calculation of t for evaluating the difference in the mean response to resilience statement by a high group and a low group

The 't' value is a measure of the extent to

Response Categories	High group					Low group				
	X	X²	f	fX	fX²	X	X²	f	fX	fX²
Agree	3	9	14	42	126	3	9	6	18	54
Undecided	2	4	01	02	4	2	4	8	16	32
Disagree	1	1	00	00	0	1	1	1	1	1
Sums			15	44	130			15	35	87
			n_H	$\sum X_H$	$\sum X_H{}^2$			n_L	$\sum X_L$	$\sum X_L{}^2$

$$\bar{X}_H = \frac{44}{15} = 2.93$$

$$\sum (X_H - \bar{X}_H)^2 = \sum X_H{}^2 - \frac{(\sum X_H)^2}{n}$$

$$\bar{X}_L = \frac{35}{15} = 2.33$$

$$\sum (X_L - \bar{X}_L)^2 = \sum X_L{}^2 - \frac{(\sum X_L)^2}{n}$$

$$\sum (X_H - \bar{X}_H)^2 = 130 - \frac{(44)^2}{15} = 0.93 \qquad \sum (X_L - \bar{X}_L)^2 = 87 - \frac{(35)^2}{15} = 5.33$$

$$t = \cfrac{\bar{X}_H - \bar{X}_L}{\sqrt{\cfrac{\sum\limits_{i=1}^{n} (X_H - \bar{X}_H)^2 + \sum\limits_{i=1}^{n} (X_L - \bar{X}_L)^2}{n(n-1)}}} = 3.47$$

which a given statement differentiates between the high score and low score groups. The 't' value equal to or greater than 2.467 ($n_1 + n_2 - 2$ df at 1% level of significance i.e. at 28 degree of freedom) indicating the average response of high and low groups to a statement differs significantly. Thus 18 statements on "Resilient *in relation to* farmers' life" (9 positive and 9 negative) with significant discriminating values were retained in the scale (Table 1).

Reliability and Validity of the scale: A scale is reliable when it gives consistently the same results when applied to the same sample. The final set of the 18 statements which represent the Resilience *in relation to* Farmers' life, was administered on three point continuum to a fresh group of 30 farmers of non sample area, who suffered from 16 June 2013 flood in Lapra and Odhri Villages of Jagadhri Block of Yamunanagar district of Haryana. The designed resilience scale for the study was pre-test for its reliability by using the split half method. Reliability was calculated by using the Formula of (Spearman, 1910 [15]; Brown, 1910)[16]. The coefficient of correlation between odd and even scores was 0.87 which was found to be significant at 1 percent level, thereby testifying the reliability of the scale.

$$r_{SB} = \frac{2 r_{hh}}{1 + r_{hh}}$$

Where, r_{hh} = Pearson correlation between odd and even

$$r_{SB} = \frac{2 * 0.7726}{1 + 0.7726} = \frac{1.5452}{1.7726} = 0.87$$

The coefficient of correlation between odd and even scores was 0.87 which was found

to be significant at 1 percent level of significance. SPSS Version 20 (Statistical Package for the Social Sciences) was used for calculating Cronbach's alpha and Guttman Split-Half Coefficient. The RFL-Scale has good internal consistency - Cronbach's alpha for the present study was 0.874 and Guttman Split-Half Coefficient value was 0.872. It shows that scale is reliable. As the content of the resilience was thoroughly covered the entire universe of farmers' life through literature and expert opinion, it was assumed that present scale satisfied the content validity.

RESULTS AND DISCUSSION

The final scale consisting of 18 (9 positive and 9 negative) statements, can be administered to the farmers on a 3 point continuum viz., Agree (A), Undecided (UD) and Disagree (DA) with a weightage of 3, 2 and 1 for positive statements and reverse scoring system for negative statements. The overall possible minimum and maximum score ranges between 18 to 54 (Table 2). The respondents have to be categorized into five groups namely 'In need (18-25), Fragile (26-33), Vulnerable (34-41), Coping (42-48) and Resilient (49-54)' after getting the response of the farmers' in 3 point continuum scale.

CONCLUSION

As Established By 'Father Of Positive Psychology, M.E.P. Seligman [10]' Resilience Can Be Measured By Suitable Scale And Built By Training. So, Resiliency Level Of Indian Farmers Should Be Measured And Built Simultaneously In Order To Prevent Them From Taking The Extreme Step Like Suicide. Moreover It Has Been Seen In India That Farmers Usually Hesitate To Share Their Opinion (Psychological Factor) As Well As Value Of Their Assets (Physical Factor) Due To Several Reasons

Table. 1: Resilience *in relation to* Farmers' Life Statements Analysis and their respective 't' Values

Sl. No.	Statements to measure Resilience in relation to farmers' Life	't' Values
1	I always hope for the best while being mentally prepared for the worst.	3.47**
2*	I feel hurt when my family and relatives don't support me, even when, I am going in the right track.	0.91
3	I learn something of value from all my mistakes.	1.90
4*	I am easily influenced by what other people think or say about me.	6.77**
5	I infuse hope to my family/relatives/ neighbours, whenever they are pessimistic.	0.74
6	I can find a solution to every problem, no matter what may be the gravity of the problem.	3.84**
7*	I don't have other kinds of job, during agricultural 'lean season'.	4.48**
8*	If my nearby school is destroyed due to flood, I don't care to send my children to the next nearby school.	4.02**
9	I prefer to spend money on my children's education than to expand my land holdings or livestock numbers.	4.58**
10*	I avoid participate in public welfare scheme that is being run in my village.	4.73**
11	I pursue my dream once I am convinced (no matter, my family or relatives oppose or support me).	0.69
12*	I don't rely on trust, reciprocity and values in the present world.	3.52**
13*	I don't give priority to groups/family solidarity.	0.96
14*	If I am poor, I don't care much to make a better living.	1.00
15	I have bounced back to my normal life (or much better than before) after the calamity.	5.18**
16*	I don't know my weaknesses and so it is very difficult for me to sort it out.	7.15**
17*	I can't demarcate between my friends and foes.	2.34
18	The incidence of the year 2008 has made me stronger to face adversity/setbacks.	0.83
19*	I usually feel depressed about my future.	0.39
20	In the coming years, I am going to opt for non-farm enterprise, which is more remunerative than Agriculture.	5.26**
21	I have someone with whom, I can share my problems.	0.41
22	I have a good sense of humour to deal with the situation of criticism.	5.76**
23	Life is not smooth path for me and that's what makes it more interesting.	6.08**
24*	I am in the company of those people who always demotivate me.	5.70**
25	There is a purpose of my life and my life has meaning.	0.25
26	I stand up for myself without putting others down.	2.31
27*	I don't have trust on my own ability.	2.11
28*	I completely depend on others in taking making my decision.	2.63**
29	I feel proud because I have accomplished things in my life.	2.36
30	I see difficulties as a God's/ nature's way to check my patience and endurance.	4.03**
31	I am a work-loving person, so I can't sit idle	2.07
32*	I spend more than my capability on the marriage/ceremony due to peer pressure.	8.69**
33*	I endorse other farmers taking the extreme steps, like suicide due to their series of problems faced by them.	9.83**

* indicates negative statements
 **Significant at 1% level of significance

Associated To It. In Addition, It HaS Also Been Seen That Farmers Are Disenchanted By Their Profession I.E. Farming, But Still Very Optimistic About Their Life. So, To Measure The Overall Resiliency Level (Psychological Factor) Of The Farmers "Resilient In Relation To Farmers' Life" Scale (RFL-Scale) Should Be Used Along With Resilience In Relation To Farmers' Profession Scale (RFP-Scale). In Order To Get The More Precise Result About The Farmers' True Condition Livelihood Security Index (Physical Factor) Should Be Used Along With Both The Resilience Scale (Psychological Factor). So, In Its First Attempt A Scale To Measure The Resilience Of Farmers In Relation To Their Life Has Been Presented In This Paper. The Resilience Scale Constructed In The Present Study Can Be Used By Future Researchers With Suitable Modifications In The Distressed Hotspots To Measure The Suicidal Tendencies Of The Farmers. The RFL-Scale Can Also Be Modified And Used For The Indian Youth (15-29 Years) As Their Suicide Rate Is Highest In Whole World.

Table. 2: Final Resilience *in relation to* Farmers' Life Scale (RFL-Scale) comprising 18 statements

S. No.	Statements	A	UD	DA
1	I always hope for the best while being mentally prepared for the worst.			
2*	I am easily influenced by what other people think or say about me.			
3	I see difficulties as a God's/ nature's way to check my patience and endurance.			
4*	I completely depend on others in taking my decision.			
5	I can find a solution to every problem, no matter what may be the gravity of the problem.			
6*	I avoid participation in public welfare scheme that is being run in my village.			
7	I prefer to spend money on my children's education than to expand my land holdings or livestock numbers.			
8*	I don't rely on trust, reciprocity and values in the present world.			
9	I have bounced back to my normal life (or much better than before) after the calamity.			
10*	I am in the company of those people who always demotivate me.			
11	I stand up for myself without putting others down.			
12*	I spend more than my capability on the marriage/ceremony due to peer pressure.			
13	Life is not smooth path for me and that's what makes it more interesting.			
14*	I don't have other kinds of job, during agricultural 'lean season'.			
15	In the coming years, I am going to opt for non-farm enterprise, which is more remunerative than Agriculture.			
16*	I know my weaknesses but it is very difficult for me to sort them out.			
17	I have a good sense of humour to deal with the situation of criticism.			
18*	I endorse other farmers taking the extreme steps, like suicide due to their series of problems faced by them.			

Note: Equal number of positive (+) and negative (-) worded statements were taken alternately to reduce the effects of social desirability and positive response bias. Asterisks (*) mark statements are reverse coded/ negative statements. A=Agree UD =Undecided DA=Disagree

REFERENCES

1. Census of India (2011) Provisional population totals - India - data sheet. Office of the registrar general and census commissioner, India ministry of home affairs, data released on 31st March 2011.

2. PTI (2013) Agriculture's share in GDP declines to 13.7% in 2012-13, news published on August 30, 2013 in The Economic Times.

3. World Health Organization (2014) Preventing suicide: A global imperative. Department of mental health and substance abuse in Geneva, Report released on September 04, 2014. p-83

4. Press Trust of India (2014) India is suicide capital, has highest number of suicides in the world: WHO, Geneva, news published on September 4, 2014 in The Indian Express.

5. Sainath P (2013) Farmers' suicide rates soar above the rest, news published on May 18, 2013 in The Hindu.

6. The National Commission on Farmers (2007) National policy for farmers under the chairmanship of Prof. M.S. Swaminathan, submitted its final report in October 2006.

DAC, MoA, Government of India. P-21.

7. Tata Institute of Social Sciences (2005) Causes of Farmer Suicides in Maharashtra: An Enquiry.

8. SAARC (2008) South Asia disaster news. SAARC Disaster Management Centre, New Delhi. 47: 1

9. Ryan L (2009) Development of a New Resilience Scale: The Resilience in Midlife Scale (RIM Scale). *Asian Social Science*, **5** (11): 39-51.

10. Seligman, E.P.M. (2011). Building Resilience. Harvard Business Review, April 2011.

11. Likert R (1932) A technique for the measurement of attitudes. Arch. Psychology, 140.

12. Edwards A.L (1969) Techniques of attitude scale construction. Vakils, Feffer and Simons Private LTD., New York.

13. Spearman C.C (1910) Correlation calculated from faulty data. *British Journal of Psychology,* **3**: 271–295.

14. Brown W, Some experimental results in the correlation of mental abilities. *British Journal of Psychology,* **3**: 296–322 (1910).