Farmers Turnedinto Brick Workers: A study on their Social Status Change

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Abstract- Agriculture has become a tough task for the farmersdueto various challenges before them. Infact they change their profession into various fields like building construction works, contract works, house keeping, hotels, wineshops & bars, dailyvendors, transportation works, dailywages, brickworks, etc. In this paper we study the socialstatus change off a rmers who has change din to brick workers around theVillupuram town, using Combined Effect Time Dependent Data Matrix [CETDmatrix].

Keywords: ATDMatrix, RTD Matrix, CETD Matrix.

I. INTRODUCTION

Fuzzyrelationsandfuzzyrelationalequationshaveimportantap plicationsinpattern classification, clustering, fuzzyin formationretrieval, preference and soon.In system models based on fuzzy set,one often uses fuzzy matricest o definefuzzyrelations. Fuzzy matrix is a matrix with elements having values in the fuzzy interval. Inthispaper the unitinterval [0,1] is called fuzzy interval.

Agriculturehasbecomeatoughtaskforthefarmersduetovariou schallengesbefore them.Infacttheychangetheirprofession intovariousfieldslikebuildingconstruction works, contractworks, housekeeping, hotels, wineshops &bars,daily vendors, transportation works, dailywages,brick works, etc.Aresearchhasbeen conductedtostudythesocialstatus changeof farmerswho haschange dintobrick workers andinferencesweredrawnusingfuzzymatrices.

II. DESCRIPTIONOF THE PROBLEMS

$P_1 \rightarrow$ Poorandinadequateelectricitysupplydrivenforciblytochange

$P_2 \rightarrow$ Sourceofwater-rain,river,canal,bonefailuresthrough

$P_3 \rightarrow$ Littleareaoflanddoesnothelpformorecultivation.

$P_4 \rightarrow$ Notaffordabletoinvestmoreonfieldsbutasworkercangetadvanceamount.

$P_5 \rightarrow$ Shortageoflaborproblemandtheirhigherwagesforcedthemtochange.

$P_6 \rightarrow$ Marginalprofitisnotenoughtorunthefamilyinagriculturewhereasnominalpay inmakingandsellingbricks, makeshappier.

$P_7 \rightarrow$ Throughouttheyearworkinthefieldisdifficultwhereasseason

alwork likebrick makingmakesmoremoney.

$P_8 \rightarrow$ Profitearnedin3monthsin brickmaking work is more thangettinginthe agricultureforanyear.

$P_9 \rightarrow$ Maketheirownconcreteroofhouse, sendingchildren toschools,neatlydressed, buyingvehicles forworks throughbrickmakingworks.

$P_{10} \rightarrow$ Livinghappierinmakingbricksratherthandoingagriculture

Basedontheirlandholding(inacres)therespondentsweregroup edintosix categoriesas detailedbelow:

Categorytabular column

Possessingland (in acres)	Agricultureperiod (inyears)	Brickworkmaking period(inyears)	Numberof respondents
0-1	8	3	18
1-3	11	4	13
3-5	7	2	15
5-6	15	2	7
6-10	10	5	5
10-15	20	4	2

Bytakingtheabovesix

categoriesasrowsandthenumberofrespondentssufferingdue toeachof thetenproblems ascolumns,a6x10 *initial rawdatamatrix*calledTimeDependent Matrix(TDMatrix) [4]isformedasgivenbelow:

Time Dependent Matrix(TDMatrix)

Possessing land(in acres)	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
0-1	18	18	15	12	16	17	11	10	12	10
1-3	13	13	9	7	12	13	8	8	12	10
3-5	15	15	6	8	14	14	10	11	13	11
5-6	7	7	1	3	7	5	4	3	4	2
6-10	1	2	1	2	4	2	1	1	2	0
10-15	2	2	0	0	0	1	0	1	0	0

TheinitialrawdatamatrixhasbeenconvertedintotheAverageTime DependentMatrix

(ATDmatrix)[4](a_{ij})bydividingeachentrywiththewidthoftherespectiveclass- interval.

Average TimeDependent Matrix (ATDMATRIX)

Land holding (inacres)	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
0-1	18	18	15	12	16	17	11	10	12	10
1-3	6.5	6.5	4.5	3.5	6	6.5	4	4	6	5
3-5	7.5	7.5	3	4	7	7	5	5.5	6.5	5.5
5-6	7	7	1	3	7	5	4	3	4	2
6-10	0.25	0.5	0.25	0.5	1	0.5	0.25	0.25	0.5	0
10-15	0.4	0.4	0	0	0	0.2	0	0.2	0	0

The average (μ_j) and standard deviation (σ_j) of every column were worked out as follows:

Average (μ_j)	.6	.65	.95	.83	.16	.03	.04	.82	.83	.75
Standard deviation (σ_j)	.91	.87	.19	.95	.22	.59	.65	.36	.05	.53

Using the average (μ_j) standard deviation (σ_j) and a parameter α from the interval [0,1] a fuzzy matrix called the Refined Time Dependent data Matrix (RTD Matrix) [4] as formed.

The RTD matrix with entries e_{ij} where $e_{ij} \in \{1,0,-1\}$ was formed using the following formula:

If $a_{ij} \leq (\mu_j - \alpha * \sigma_j)$ then $e_{ij} = -1$

Else if $a_{ij} \in (\mu_j - \alpha * \sigma_j, \mu_j + \alpha * \sigma_j)$ then $e_{ij} = 0$

Else if $a_{ij} \geq (\mu_j + \alpha^* \sigma_j)$ then $e_{ij} = 1$

By varying the parameter $\alpha \in [0,1]$ any number of *refined time dependent data matrices* can be obtained. Three of such matrices obtained are given below:

RTD Matrix for $\alpha = 0.25$

RowSum matrix

$$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & -1 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} 10 \\ 2 \\ 4 \\ -2 \\ -10 \\ -10 \end{pmatrix}$$

TD Matrix for $\alpha = 0.5$ Row sum matrix

$$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} 10 \\ 0 \\ -1 \\ -1 \\ -10 \\ -10 \end{pmatrix}$$

RTD Matrix for $\alpha = 0.75$

RowSum matrix

$$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & 1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} 10 \\ -10 \\ -9 \\ -10 \\ -10 \\ -10 \end{pmatrix}$$

By combining all these three matrices, the *Combined Effect Time Dependent DataMatrix* (CETDMatrix), which gives the cumulative effect of all these entries was obtained as follows:
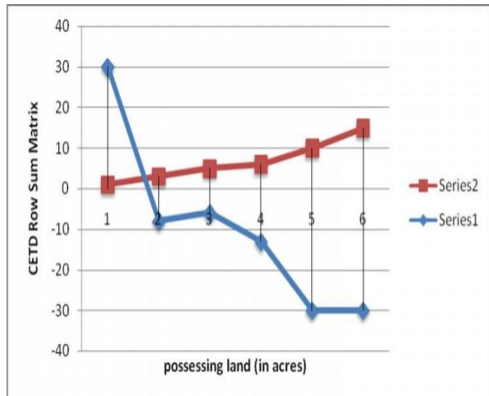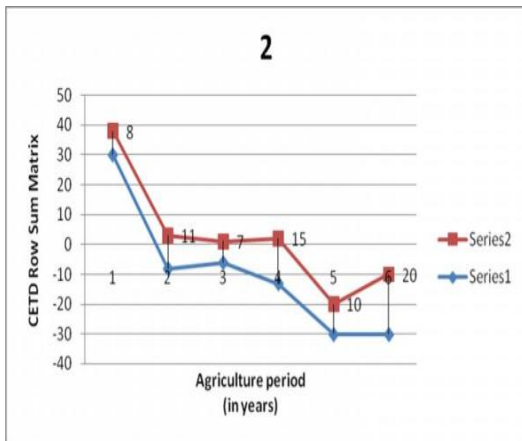
CETDMatrix

RowSum matrix

$$\begin{pmatrix} 3 & 3 & 3 & 3 & 3 & 3 & 3 & 3 & 3 & 3 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & 0 & 0 \\ -1 & -1 & -1 & -1 & -1 & -1 & 0 & -1 & 0 & 0 \\ -1 & -1 & -3 & -1 & -1 & -1 & -1 & -1 & -1 & -2 \\ -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 \\ -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 & -3 \end{pmatrix} \begin{pmatrix} 30 \\ -8 \\ -6 \\ -13 \\ -30 \\ -30 \end{pmatrix}$$

i.Thegraphasshownbelowexhibitedthegroupofrespondentsbased onlandholding.
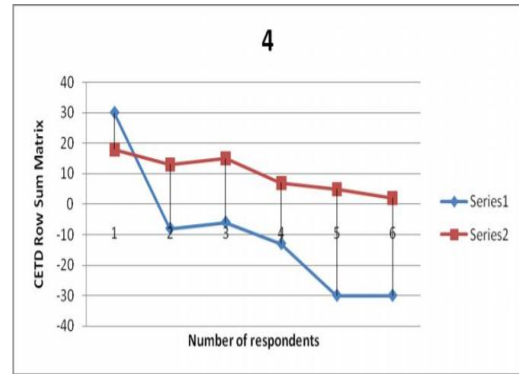

ii.Thegraphasshownbelowexhibitedthegroupofrespondentsbase don the agricultureworkperiod.

iii.Thegraphasshownbelowexhibitedthegroupofrespondentsbas edonthe Brickmakingworkperiod.
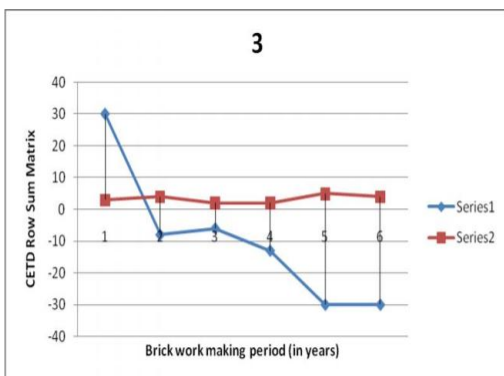
iv.Thegraphasshownbelowexhibitedthegroupofrespondentsbase donthe numberofrespondents

v.Thegraphasshownbelowexhibitsthepossiblecomparisonofallth edata.
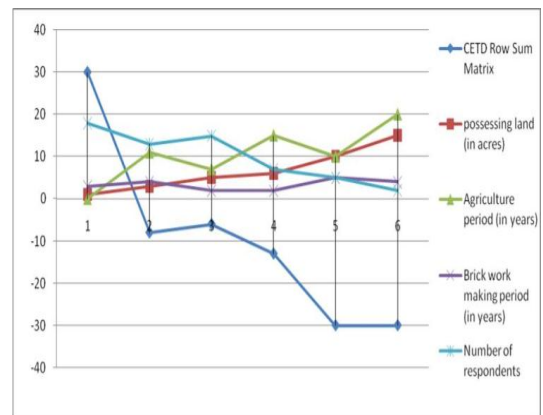
III. CONCLUSION

Fromtheabovegraphitisunderstood that there spondents havinglandup to3 acreshavebeenbenefittedbythe change oftheirprofession fromagriculturetobrickmaking. The social statuswasfoundtobesatisfiedforthem.
Butifthiscontinuesthenslowlyallfarmersmayturntobedivertedfor other jobswhichis agreatloss for the nationintheagrosector. The governmentandother forums shouldcomeforward tosave thefarmers whoarereallyintrouble.

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