Disillusionment to Entropy: The Agony of Indian Farmers

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Abstract—*Indian agriculture is a victim of poverty amidst phenomenon like disillusionment of farmers of higher production with lower income, which has brought them in dereliction of growing more and more in their farm. The heart of crisis is unjustified growth of social entropy despite bumper crop production but accomplishing less income. The last 20 years, according to the government statistics more than three lakh farmers have committed suicide in India. The situation of the farmers was never very good to begin with, but has been steadily declining and reached its nadir. The root cause of the present state of desperation of Indian farmers lie in green revolution and policies adopted there in. The present study is the analysis of farmers growing social entropy with displaying of their negative cognitive behavior viz. discontinuance, rejection, disagreement, conflict, dissonance, reinvention and confusion. An ex post facto method of research design method was conducted in West Bengal. Face to face interview was conducted with 75 respondents with the help of structured interview schedule. Data were analyzed with the help of following statistical tools viz. coefficient of correlation, stepwise regression, It has been found that occupation index, Adoption leadership (x17) and gender, were predominating causal factors for social entropy. Therefore, farming occupation for small and marginal farmers with high income, adoption leadership will help to minimize the social entropy of rapid industrialized agricultural system in India. Disagreement (y3) and Reasons of dissonance (y5) are attuned with Family education status (x3), Information seeking behavior (x29), Occupation (x8), Annual income (x13) and Educational aspiration (x4).*

Keywords: *Social Entropy, Motivation, Modernization, Sustainability, Urban Sprawl.*

1. INTRODUCTION

India is agriculture intensive country where 65 per cent of the work force belong to agriculture sector contributing about 14 per cent in national GDP through agriculture produce. Despite the fact farmers in some part of the county are committing suicide. Agricultural land has not only been fragmented in smaller pieces but also shrinked due to urbanization. Fragmented land, lack of infrastructure to fight flood and draught have caused them highly indebted, migrated, malnutrition and all ills with them. Adverse climatic condition has again magnified the plight of Indian farmers.

Indian agriculture is dependent of nature. Any failure adversely affect the farmers. Unorganized agricultural system forces the farmers in unsystematic manner. They lack technical support in addition to institutionalized finance. Famers get seasonal occupation making them unemployed in some part of the year.

Indian agriculture is a mix of traditional to modern farm techniques. Girish Mahajan and Prakash Mehta (2003) Revealed that there was higher level of agricultural diversification in developed villages as compared to the backwards ones. In developed villages, both economic factors; farm size, tractors, bullocks, extent of tenancy. Farm income, and non-farm income and social factors; family size, age, education of the head of the family and distance were important determinants in explaining the variation in the Herfindal and entropy indices.

Traditional use of cattle to plough leads to low productivity and poor income. In India, 83 per cent of farmers are small holders with less than one hectare of land holding, these small holder farmers do not have access to cold storage and have no option but to sell their produce to middle man and traders. Between 2012 and 2015, over 10,000 farmers killed themselves. Farmer suicides are a major cause of political contention, despite the fact that they are not a new occurrence and the factors driving these deaths – crop failures, an inability to get the market price and insurmountable debt – are sometimes beyond the control of policymakers. Acharya, S, (1995) revealed that Extension literature on the relationship between rates of economic growth and incomes have questioned whether the poor benefit from rising agricultural output. A definitive answer has been handicapped by the paucity of consistent long term series. There is also disagreement on the causal linkages between growth in output and changes in the income of the poor. Social Entropy is the manifestation of entropy which is distinguished by expression of negative cognitive behavior like disagreement and farmers' perception on dissonance. Social entropy an analogy of principal of thermodynamics which had been applied herewith. In a closed system of energy flow the gap between work done and energy lost is widening and with the increase

between motivations unleashed and accomplishment made the social entropy will be increasing.When the entire amount of motivation released through Training, education or simulation is not consumed through a proportionate accomplishments, which will lead to a kind of social ecological dissonance. The villages cannot be perceived as a dumping ground of agrochemicals or exotic commercial ideas and if done so, after a yawning gap between motivations unleashed and works done, that perhaps lead to a stressed and chaotic situation in the social ecology leading to a social isolation even to committing suicides.Pedro Cabral et al, 2013 summarized multifaceted character of Social Entropy with regard to its implication for urban sprawl and propose a framework to apply concept of entropy to urban sprawl for monitoring and management. Pedro Cabral also conclude that in any open system, an increase of work necessarily points that an increase of entropy and the production level can be maintained only if the system expand. Urban growth is therefore a necessary condition for the urban system prevail. In the complex and interrelated process involved in urban growth and sprawl, Etropy must be kept within a range defined by the minimum value below which system becomes vulnerable and unstable. Keeping all the facts in view following objectives have been carved out.

1. Development and elucidation of concept on Social Entropy.

2. To identify, customize and optimize predictor and predicted variables for conducting empirical studies in social entropy.

3. To estimate the relation and interaction of different selected variables of both inter and intra level in relation as well as interaction.

4. To device some policies implications from this empirical study as applicable towards managing social entropy in the realm of function of rural system.

2. METHODOLOGIES

Ex post facto method of research design was adopted for conducting research in village from West Bengal named, Ghoragachha, selected purposely. Structured interview schedule was pretested and taken as a tool for conducting survey with the 75 farmers from the village. Data collected, tabulated and analyzed with the help of statistical tools viz., Step down regression, and Canonical correlation.

Independent variables:

Age (x1), Education (x2), Family Education Status (x3), Educational Aspiration (x4), Family Size (x5), Male: Female Ratio (x6), Urbanization Index (x7), Occupation (x8), Cropping Intensity (x9), Farm Size (x10), Expenditure Allotments (x11), Credit Load (x12), Annual Income (x13) , Electricity Consumption (x14), Fuel Consumption (x15), Irrigation index (x16), Adoption leadership (x17), Scientific

orientation (x18), Independency (x19), Innovation proneness (x120), Risk orientation (x21), Economic motivation (x22), Orientation towards competition (x23), Management orientation (x24), Production orientation (x25), Market orientation (x26), Social participation (x27), Utilization of cosmopolite source of information (x28), Information seeking behavior (x29), Training received (x30), Distance matrix (x31), Drudgeries (x32).

Dependent variables: Perception on discontinuance (y1), Perception on rejection (y2), Disagreement (y3), Conflict (y4), Reasons for dissonance (y5), Reasons for Reinvention (y6), Confusion index (y7) and Social Entropy (Y)

Social Entropy was estimated with the following formula.

$$Social\ Entropy\ =\ \frac{y1 \times y2 \times y3 \times y4 \times y5 \times y6 \times y7}{7}$$

3. RESULTS AND DISCUSSION

The findings based on the revelation of results and its implications are presented herewith through different tables and figures and models.

Table 1: Stepwise regression analysis Social entropy (Y) versus 32 independent variables of village, Ghoragachha, West Bengal: Predominating variables retained at the last step.

N = 75								
Predictors	**B**	**S.E**	**Beta**	**t**	**R**	**R²**	**R² Adjusted**	**SE Estimated**
Occupation (x8)	18972.096	6256.954	0.318	3.032**				
Adoption leadership (x17)	16986.733	5780.698	0.307	2.939**	0.473	0.224	0.191	58028.00
Gender (x6)	-15146.956	7446.915	-0.213	-2.034*				

Revelation:

Table 1 presents the stepwise regression analysis of the dependent variable, **Socialentropy (Y)** versus 32 independent variables. It has been found that three variable, **Occupation (x₈), Adoption leadership (x₁₇)** and **Gender (x₆)** have been retained at the last stage of step down regression analysis towards predicting **Social entropy (Y).** The value of R^2 being 0.224, it is to infer that all the three predictors altogether have explained 22 per cent variance embedded with the predicted variable i.e. **Social entropy (Y).**

Implication:

Occupation of respondents is the most important causing factor for generating **Social entropy(Y)** implies that farming occupation provided opportunities to them for adoption of

modern agricultural technology to make them more ordered or stable financially.

The variable, **Adoption leadership (x_{17})** further second most important independent variable for increase in Social entropy as higher the adoption of new technology gives impetus in the process of technology socialization which in turn make them more ordered.

The gender issue, as has been depicted, elicited that it has a decisive impact on the nature and extent of entropy.

Table 2: Standardized Canonical correlation coefficient for Dependent variables as well as Independent variables of village, Ghoragachha, West Bengal

| N = 75					
Dependent variables			**Independent variables**		
Disagreement (y3)	0.353		Family education status(x3)	0.587	
			Annual income (x13)	0.338	
Reasons for dissonance (y5)	-0.756		Educational aspiration (x4)	-0.533	
			Occupation (x8)	-0.401	
			Information seeking behavior (x29)	-0.546	
Variance explained by dependent variables			Variance explained by covariates		
CAN VAR	PctVar Covariate	PctVar Dependent	CAN VAR	PctVar Covariate	PctVar Dependent
1	25.93	32.69	1	7.13	5.65
Loading factor > 0.3					

Table 2 presents the standardized canonical correlation for covariate as well as for dependent variables of village, Ghoragachha, West Bengal.

Canonical correlation presents a unique inter and intra variable interaction in a didactic manner. Here, all the variables have been dichotomized into set of variables i.e. left side and right side variable. Here, in this case the left side variable represents sets of seven consequent variable *viz.* Perception on discontinuance (y_1), Perception on rejection (y_2). Disagreement (y_3), Conflict (y_4), Reasons for dissonance (y_5), Reasons for reinvention (y_6), and Confusion index (y_7) and the right side causal variable *viz.* Age (x_1), Education (x_2), Family education status (x_3), Educational aspiration (x_4), Family size (x_5), Gender (x_6), Urbanization index (x_7), Occupation (x_8), Cropping intensity (x_9), Farm size (x_{10}), Expenditure allotment (x_{11}), Credit load (x_{12}), Annual income (x_{13}), Electricity consumption (x_{14}), Fuel consumption (x_{15}), Irrigation index (x_{16}), Adoption leadership (x_{17}), Scientific orientation (x_{18}), Independency (x_{19}), Innovation proneness (x_{20}), Risk orientation (x_{21}), Economic motivation (x_{22}), Orientation towards competition (x_{23}), Management orientation (x_{24}), Production orientation (x_{25}), Market orientation (x_{26}), Social

participation (x_{27}), Utilization of cosmopolite source of information (x_{28}), Information seeking behavior (x_{29}), Training received (x_{30}), Distance matrix (x_{31}), Drudgeries (x_{32}).

Here, it has been found that the two left side variable *viz.* Disagreement (y_3) and Reasonsfor dissonance (y_5) have been selectively attuned to the following right side causal variable *viz.* Family education status (x_3), Information seeking behavior (x_{29}), Occupation (x_8), Annual income (x_{13}) and Educational aspiration (x_4). Therefore, these variables are strategically attuned and interactive that may lead to a micro-level policy decision *e.g.* the respondents having perception on rejection, they are also confused and in this situation both the traits of respondents are selectively being impacted by the other cognate characters like Educational aspiration (x_4), Family size (x_5), Electricity consumption (x_{14}), Market orientation (x_{26}), Social participation (x_{27}), and Farm size (x_{10}).

It has also been found that the dependent variables, explained 32.69 per cent variance in self, whereas 25.93 per cent variance explained embedded in covariates variables. Table also shows that covariate variables have explained 7.13 per cent variance embedded in self and 5.65 per cent variance explained embedded in dependent variables.
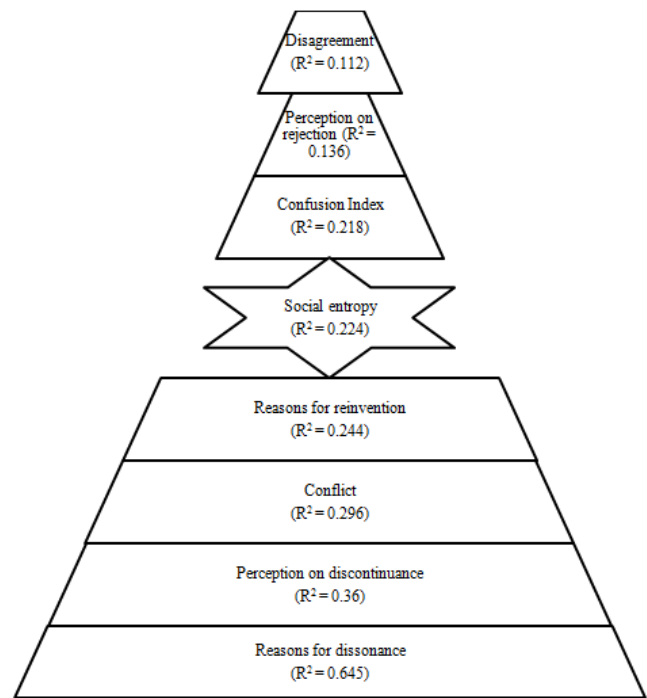
Model 1: Social Entropy Model, village Ghoragachha (West Bengal)

Model 1 of social entropy reveals that Reasons for dissonance ($R^2=0.645$), Perception on discontinuance ($R^2=0.36$), Conflict ($R^2=0.296$), Reasons for reinventions ($R^2=0.244$), Confusion index ($R^2=0.218$), Perception on rejection ($R^2=0.136$), and

Disagreement (R^2=0.112) and contributed in the growth of social entropy among the farmers of the village, Ghoragachha.

4. CONCLUSIONS

Farmers' disillusionment and dissonance must be addressed to make Indian agriculture sustainable. Indian farmers have remained ignored since 1991 despite their hard working, engaged in providing food and cloth to the entire nation. In a family farmer, when the only bread earner dies, his family live in abject destitution.

Energy in low entropy agriculture should be infused with heavy investment, which can be done by both center and state to create infrastructure. Gradual capital investment in individual famers irrigation, technology, motivating them to adopt organic agriculture can make the agricultural ecosystem sustainable and can prevent it from leaping in high entropy agriculture.

REFERENCES

[1]   Acharya, S.; Papanek, G.F. (1995). Explaining Agricultural Wage Trends in India. *Development Policies Review*. **13**(1): 23-39.

[2]   Cabral, P; Santos, J. A.; Augusto, G (2013). Monitoring Urban Sprawl and the national ecological reserve in Sintra- Cascais , Portugal: Multiple OLS linear regression model evaluation. *J. Urban Plan, Dev*. 137, 346-353.

[3]   Mahajan, Girish; Mehta, Prakash (2003). Asia-Pacific-Journal-of-Rural-Development. **13**(2): 1-18.

[4]   Meghna (2010). Ten Measures to Tackle the Issue of Farmers Suicide in India. *Legal Drift.* http://www.legaldrift.com/10-measures-to-tackle-the-issue-of-farmer-suicides-in-india.

[5]   Mishra, Dinesh. (2017).The Plight of Indian Farmers. *India Opines*. http://indiaopines.com/narendra-modi-indian-farmers. 3, September.

[6]   Nilanjanbanik. 2017. Decoding the Agony of Indian Farmers. *The Wire.*https://thewire.in/127803/decoding-the-agony-of-the-indian-farmer.