

Dissonance in Transforming Farm Ecology in India: A System Approach to Measure Social entropy in Rural India

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ABSTRACT

The Indian Council of Agricultural Research has already earned the impression that farmers are gradually becoming disillusioned on the way Indian agriculture is steering the modernization process. A little above 42 per Cent of the farmers are ready to quit farming occupation, had there been alternatives jobs available. The other important area for disillusionment has been the simmering confusion amongst the farmers, who are economically stressed, information wise overloaded and conceptually confused. This has gone further worsened with unabated rise of input price and substantive slashing of minimum support prices. The vagaries in the behavior of agricultural market and increasing aberration, whether compressing land man ratio are just adding more fogs to confusion. The present study has identified this problem as one of the institutional and operational barriers to the Technology Socialization Process. It has been indentified that variables fuel consumption and market orientation have added decisive input in characterizing and qualifying the level of confusion. The same two variables have also directly and indirectly scaled up the level of confusion on process of Technology Socialization. The Confusion Index, the predicted variable in the study, has strategically hooked up the following variables to characterize the whole of the socialization process in the forms of complex polymorphic and mutually contradictory information decision process, and these are, Education Aspiration (x4), Family Size (x5), Electricity Consumption (x14), Market Orientation (x26), Social Participation (x27), and Farm Size (x10).

Keywords: *Adoption, Farm modernization, Capacity building, Technology Socialization, Energy consumption*

1. INTRODUCTION

The aftermath of 'second world war' provided a jerk of eruptive development. The decades of fifty's and sixty's in the third world countries were transformed into a recipient of exotic technological innovations from western nations. Westernization and modernization process were made only a dynamic interplay of implicit and explicit values of technology transfer to usher an

imposed socialization. The history of diffusion research in India had a skewed focus on adoption process and decision in favor of prescribed technology. Development through diffusion of agricultural innovation in any sphere within the social system is not a linear phenomenon, rather it is the multitudes of interactions among the innumerable elements constituting the very social system and leading to an intricate fabrication of multidimensional dynamism. The agricultural scientists of experimental stations, planners and implementing agencies form a techno cultural complex situation where the ideas, techniques, innovations, components and device, flow from. Therefore, it is very likely that confusion may arise in the process of Technology socialization. Subiakto, (2011) revealed that the government had an important role, particularly in pest control on cotton crops socialization and technical assistance because of high cost. Hung Chao Chia *et. al.*, (2011) demonstrated that the alcohol related socialization factors could directly influence adolescent drinking behavior and had direct effects on alcohol use that were mediated by cognitive factor partially. Noda, K., (2006) found that often, land reclamation was caused by confusion and the economic distress of the small landowners. There were many landowners who lived in their own villages and cultivated a part of their own land. These people had many difficulties that were created by the economical-social confusion at that time. For example, city and industrial areas were destroyed by the war, and the repatriation that followed was also responsible for some of these troubles. (Noda, K., 2006). Narayangowda *et. al.*, . (1991) examined the extent of adoption of recommended practices of rainfed potato cultivation practices and reasons for non-adoption of recommended practices in three major potato growing taluks of Hassan district, Kanataka, India.

2. OBJECTIVES

1. To identify some socio-economic, socio-psychological and agro-economic factors responsible for dissonance regarding the prescribed technology;
2. To establish intra and inter relationship among the identified socio-economic, socio-psychological and agro-economic variables influencing confusion among the respondent;
3. To isolate some factors contributing to create dissonance among the respondents;
4. To estimate dissonance level among respondents for prescribed technology, hindering the smooth process of technology socialization.

3. METHODOLOGIES

Ex post facto method of Research design was adopted to conduct face to face interview with 75 respondents of village Chiroura in the state, Bihar. Information were collected, tabulated and analyzed with following statistical tools viz. Correlation coefficient, Stepwise regression, Path analysis and Canonical correlation.

The 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).

The dependent variables:

Dissonance Index (y) has been measured in terms of multiplication of confusion, rejection, disillusionment and discontinuance values over the summative values of technology socialization.

4. RESULTS

Table 1: Coefficient of Correlation between Dissonance index (y7) and 32 independent variables of village Chiroura, Bihar.

N = 75	
Variables	Coefficient of Correlation (r)
Age (x1)	0.030
Education (x2)	-0.041
Family education Status (x3)	-0.068
Educational aspiration (x4)	-0.001
Family size (x5)	0.037
Gender (x6)	-0.193
Urbanization index (x7)	-0.065
Occupation (x8)	-0.210
Cropping intensity (x9)	-0.009
Farm size (x10)	-0.227
Expenditure allotment (x11)	0.011
Credit load (x12)	-0.220
Annual income (x13)	0.046

Electricity Consumption (x14)	0.160
Fuel consumption (x15)	-0.342**
Irrigation index (x16)	-0.096
Adoption leadership (x17)	0.148
Scientific orientation (x18)	0.243*
Independency (x19)	0.020
Innovation proneness (x20)	0.126
Risk orientation (x21)	0.038
Economic motivation (x22)	0.003
Orientation towards competition (x23)	0.108
Management orientation (x24)	-0.004
Production orientation (x25)	0.052
Market orientation (x26)	0.413**
Social participation (x27)	0.159
Utilization of cosmopolite source of information (x28)	0.110
Information seeking behavior (x29)	0.328**
Training received (x30)	-0.078
Distance matrix (x31)	-0.243*
Drudgeries (x32)	-0.026
*Significant at 0.05%	
**Significant at 0.01%	

Table 1 presents coefficient of correlation between Dissonance index (y7) and 32 independent variables of Chiroura. The table reveals that the three variables *viz.* Marketing orientation (x26) and Information seeking Motivation (x29) and Scientific orientation (x18) are significant and positively correlated with the Confusion Index (y7). It has also been found that Fuel consumption (x15) and Distance matrix (x32) is highly significant but negatively correlated with confusion Index (y7).

Both Marketing orientation (x26) and Information seeking behavior (x29) are driving the respondents to go for alternatives and better choices for transforming the present agricultural based

livelihood. In this entire process the hunt for information and consumer choices, many a time, go mutually juxtaposed to create what we call confusion.

Negative correlation of Fuel consumption (x15) with dissonance indicates status of the pseudo-modernization process emanating from a conflict between pull and push factor of modernity-traditionality dichotomy so, less the level of modernization, the higher has been the confusion.

Orientation towards science breeds both confidence and confusion. Confidences are coming out because old disputes are resolved; Dissonance is simmering up because old solution has already been obsolete, hence new confusion is generating.

The shorter the distance the higher would be the vicinity to strategic locations adding to, what we call, access to higher number of alternatives and confusion.

Table 2: Step-wise regression analysis Confusion index (y7) versus 32 independent variables of village Chiroura, Bihar : Predominating Variables retained at the last step.

N = 75								
Predictors	B	S.E	Beta	T	R	R ²	R square Adjusted	SE Estimated
Market orientation (x26)	0.35 6	0.09 4	0.384	3.784**	0.51 3	0.263	0.243	0.714
Fuel consumption (x15)	0.00 0	0.00 0	-0.306	- 3.014**				

Table 2 presents the stepwise regression analysis of Confusion index (y7) versus 32 independent variables of village Chiroura. It has been found that the two independent variables viz. Market orientation (x26) and Fuel Consumption (x15) have been retained at the last step of screening. The R² being 0.263, it is to infer that both two predominating variables have explained 26 per cent variance embedded with the predicted variable i.e. Confusion Index (y).

Market orientation (x26) and Fuel consumption (x15) have explained the 26 per cent variance in Confusion index (y7). And is enough to conclude that the process of modernization it confines and goes stale half way, then confusion is sure to visit the psyche of the farmer with good harvest and bad market price, with high scientific orientation and poor access to Fuel consumption all are emitting and simmering high level of confusion for taking the respondents to a confused behavioral dispositions.

Table 3: Path analysis Dissonance Index (y7) versus 32 exogenous variables of village Chiroura, Bihar

N = 75						
Variables	TE	TDE	TIE	Substantial Indirect Effect		
				I	II	III
Age (x1)	0.030	-0.070	0.100	-0.165(x10)	-0.132(x3)	0.129(x27)
Education (x2)	-0.041	0.202	-0.243	-0.213(x10)	-0.156(x3)	0.126(x4)
Family education Status (x3)	-0.068	-0.415	0.347	-0.277(x10)	0.261(x4)	0.138(x27)
Educational aspiration (x4)	-0.001	0.298	-0.299	-0.363(x3)	-0.273(x10)	0.108(x27)
Family size (x5)	0.037	0.390	-0.353	-0.227(x10)	-0.230(x14)	0.076(x27)
Gender (x6)	-0.193	0.037	-0.230	-0.080(x10)	-0.051(x12)	0.043(x32)
Urbanization index (x7)	-0.065	-0.170	0.105	0.053(x26)	0.051(x10)	-0.034(x27)
Occupation (x8)	-0.210	-0.216	0.006	0.074(x10)	-0.061(x29)	0.047(x32)
Cropping intensity (x9)	-0.009	-0.128	0.119	0.140(x10)	0.106(x3)	-0.074(x15)
Farm size (x10)	-0.227	-0.658	0.431	0.184(x15)	-0.174(x3)	0.160(x27)
Expenditure allotment (x11)	0.011	0.045	-0.034	-0.221(x10)	0.056(x15)	0.051(x29)
Credit load (x12)	-0.220	-0.167	-0.053	-0.186(x10)	0.145(x15)	0.143(x14)
Annual income (x13)	0.046	0.081	-0.035	-0.245(x10)	0.105(x15)	0.078(x14)
Electricity Consumption (x14)	0.160	0.457	-0.297	-0.197(x5)	-0.104(x27)	-0.052(x12)
Fuel consumption (x15)	-0.342**	0.280	-0.622	-0.432(x10)	-0.120(x3)	-0.100(x29)
Irrigation index (x16)	-0.096	-0.065	-0.031	-0.131(x27)	0.107(x10)	0.048(x29)
Adoption leadership (x17)	0.148	0.002	0.146	0.116(x27)	0.087(x29)	-0.055(x30)
Scientific orientation (x18)	0.243*	0.060	0.183	0.131(x10)(x29)	-0.104(x15)	0.071(x27)
Independency (x19)	0.020	0.171	-0.151	-0.073(x27)	0.050(x30)	-0.048(x14)
Innovation proneness (x20)	0.126	0.230	-0.104	-0.152(x10)	-0.097(x3)	0.076(x4)
Risk orientation (x21)	0.038	-0.122	0.160	0.058(x14)	0.057(x15)	0.046(x29)
Economic motivation (x22)	0.003	-0.030	0.033	0.085(x10)	0.072(x19)	0.046(x3)
Orientation towards competition (x23)	0.108	0.084	0.024	-0.209(x10)	0.118(x27)	-0.103(x3)
Management orientation (x24)	-0.004	-0.102	0.098	-0.135(x10)	0.122(x15)	0.102(x14)
Production orientation (x25)	0.052	0.079	-0.027	0.138(x10)	-0.064(x15)	-0.061(x20)
Market orientation (x26)	0.413**	0.394	0.019	0.055(x14)	0.052(x29)	0.044(x3)
Social participation (x27)	0.159	0.462	-0.303	-0.228(x10)	-0.124(x3)	-0.103(x14)
Utilization of cosmopolite source of information (x28)	0.110	-0.153	0.263	-0.217(x10)	0.149(x29)	0.108(x27)
Information seeking behavior (x29)	0.328**	0.323	0.005	-0.087(x15)	-0.075(x27)	-0.071(x28)
Training received (x30)	-0.078	-0.243	0.165	0.087(x27)	0.050(x29)	0.048(x14)
Distance matrix (x31)	-0.243*	-0.031	-0.212	-0.090(x10)	-0.087(x26)	-0.067(x14)
Drudgeries (x32)	-0.026	-0.222	0.196	-0.134(x10)	0.064(x5)	0.062(x26)
Residual Effect	0.574					
Highest count	Farm Size (x10):24					

Table 3 presents path analysis of Dissonance Index (y7) versus 32 exogenous variables of village Chiroura. The table reveals that the exogenous variable Farm size, (x10) has exerted the highest total direct effect whereas the exogenous variable, Fuel consumption (x15) has exerted the highest indirect effect. It has also been found that the exogenous variables, Farm size (x10), has routed the highest substantial indirect effect of as many as 24 exogenous variables to characterize the dependent variable Confusion index (y7). The residual effect being 0.574, it is to infer that even with the combination of 32 exogenous variables, 43 per cent of the variance of confusion Index has been explained so far.

The Poor farmers because of lower farm size and lower fuel consumption are prone to be more confused. They are neither supported by the remunerative market price of their produce nor lowering of cost of inputs. This has created a state of being of sandwiched between what we call, a dual and diabolic pressure from price and cost.

Table 4: Standardized Canonical Correlation for Covariate as well as for Dependent variables of village Chiroura, Bihar

N = 75						
For Dependent Variables			For Covariate Variables			
Perception of rejection(y2)	of	+0.344	Educational aspiration (x4)		+0.433	
			Family size (x5)		+0.360	
			Electricity consumption (x14)		+0.494	
			Marketing orientation (x26)		+0.442	
			Social participation (x27)		+0.328	
Farm Size (x10)		-0.757				
Confusion index (y7)		+0.536				
Variance in Dependent variables explained By Canonical variables			Variance in Covariate Variables explained By Canonical variables			
CAN VAR	Pct Var DEP	Pct Var COV	CAN VAR	Pct Var DEP	Pct Var COV	
1	48.30	36.50	1	3.36	4.464	
Loading Factor >0.3						

Table 4 presents the standardized canonical correlation for covariate as well as for dependent variables of village Chiroura.

The 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. In this case the left side variable represents sets of seven consequent variable viz. Perception on discontinuance (y1), Perception on rejection (y2), Disagreement (y3), Conflict (y4), Reasons for dissonance (y5), Reasons for reinvention (y6), and Confusion index (y7) and the right side causal variable viz. Age (x1), Education (x2), Family Education Status (x3), Educational Aspiration (x4), Family Size (x5), Gender (x6), Urbanization Index (x7), Occupation (x8), Cropping Intensity (x9), Farm size (x10), Expenditure Allotment (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 (x20), 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), Electricity Consumption (x14),

Here, it has been found that the two left side variable viz. Perception on rejection (y2) and Confusion index (y7) have been selectively attuned to the following right side causal variable viz. Educational Aspiration (x4), Family Size (x5), Electricity Consumption (x14), Marketing Orientation (x26), Social participation (x27), and Farm size (x10). Therefore, these variables are strategically attuned and interactive that may lead to a micro-level policy decision eg the respondents having perception on rejection, are also confused and in this situation, both the traits of respondents are selectively being impacted by the other cognate characters like, Educational Aspiration (x4), Family Size (x5), Electricity Consumption (x14), Market Orientation (x26), Social participation (x27), and Farm size (x10).

It has also been found that Dependent variables explained 48.30 per cent Variance in dependent variables whereas dependent variable explained 36.50 per cent variance in covariates variables. Table also shows that covariate variables explain the 3.36 per cent variance in covariate variable and covariate variables explains 4.46 per cent variance in dependent variables.

5. CONCLUSION

Disillusionment and Dissonance among the farmers regarding prescribed technology is apparently an aberrant social phenomenon, which makes the farmers alienated from the technology socialization process. Innovative farmers adopt the new technology but when they are finally exposed to market infrastructure and profitability of the technology, they are confused and disillusioned. Moreover, the farmers are conceptually confused, operationally juxtaposed and motivationally perplexed. This is an invisible psychological barrier towards effective socialization

of technology. This kind of empirical research can help a go towards creating a resilient model accommodating effective and sustainable process of technology socialization, confusion embedded within a farmer needs to be pumped out or resolved otherwise the perplexed horse will be just limping without progress.

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