Identifying the Factors of Social Dynamics among the Drip Users – A Socio-Technological Enquiry

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ABSTRACT

Social-dynamics exists in a society plays a major role in adoption of any technologies and determined by various external and internal factors. Identification of the the factors influencing the social dynamics is one of the arduous tasks in front of the social scientists. This research paper tries to ascertain the factors responsible for social dynamics among the different categories of drip users. Three different categories of drip users viz sugarcane, onion and leaf banana growers were selected for the study. From each category, 40 respondents were selected based on proportionate random sampling method and thus 120 respondents were constituted for the study. The present study was carried out in Coimbatore South and Udumalpet taluk of Coimbatore district with the objective to quantify the overall social-dynamics exists among the respondents as well as to find out the factors responsible for social-dynamics. Principle component analysis and factor analysis reveled that social dynamics of a society could be determined by the factors such as social structure, social network and social issue. Among these factors, social structure accounted for the maximum percentage of the total variance on the overall social-dynamics followed by social network and social-issues factors.

***Key words:** Social dynamics; Drip users; Social dynamics indicators; Factors of social dynamics;*

Among various resources, water is most depleting resource on the earth. Micro irrigation is one of the advanced technologies and it is evident that it saves water up to 84 per cent depending on crop and situation and yield advantage is up to 66.6 per cent. Even though it has tremendous advantages, its development in India is slow as compared to other developing countries (*Kumar and Singh, 2002*). In India, drip irrigation is adopted in 4 lakh hectares. Maharashtra is the leading state where 1.42 lakh hectares area is under micro irrigation system followed by Karnataka in an average of 64 thousand hectares. Tamil Nadu ranks third putting at least 43.4 thousand hectares of area under drip irrigation. However, total drip irrigated area is less than one percent of the total irrigated area in India.

There are several aspects which determined the adoption of drip irrigation; among them social dynamics is very important one. In the recent past, several researchers studied the social dynamics in various dimension such as social value, status, process etc. But as such there is no holistic study has been conducted on social dynamics since quantification and identification of indicators have been felt arduous. The present study aims to quantify the overall social dynamics exists among the respondents as well as to find out the factors responsible for social-dynamics.

METHODOLOGY

The present study was carried out in undivided Coimbatore district during the year 2008-09. Out of the nine taluks in the district Coimbatore South and Udumalpet were selected since most of the drip installation works for horticultural crops (Onion and Leaf banana) and sugarcane have been undertaken in the taluk respectively. In next stage, Thondamuthur and Udumalpet blocks were purposively selected from Coimbatore South and Udumalpet taluks respectively.

For Thondamuthur and Udumalpet block, village-wise beneficiaries list in the present micro irrigation scheme have been obtained from the office of Assistant Director of Horticulture. From the list, 40 onion growers, 40 leaf banana growers and 40 sugarcane growers were selected by proportionate random sampling method. Thus, 120 drip users were selected.

Social dynamics was operationalised as the extent to which the existence of selected social indicators are perceived by the respondents at given point of time. Identification of indictors affecting the social dynamics was carried over through intensive analysis of literature. Further scrutiny was done by discussion with experts from the relevant field. Based on preliminary discussion seventeen indicators which determine social dynamics were selected. The final inventory of indicators was subjected to relevancy rating by 35 Judges. The responses received from the Judges were analysed and the relevancy co-efficient of 'i' th indicator (RCi) was worked out by using the following formula:

$$RCi = \frac{TSJ}{MSC \times TNJ}$$

Where

RCi = Relevancy co-efficient

TSJ = Total score of all the judges on the 'i'th indicator

MSC = Maximum score on the continuum

TNJ = Total numbers of Judges

Those indicators with relevancy co-efficient of 0.6 and above were selected to quantify the Social dynamics and the selected indicators with it's relevancy co-efficient were given in Table 1.

Table 1. List of selected Social dynamics indicators with their relevancy coefficient

Indicators	Relevancy co-efficient
Social Value	0.9132
Social Status	0.8561
Social Process	0.8553
Social Stratification	0.8213
Social Solidarity	0.7129
Group Dynamics	0.7100
Leadership Behaviour	0.6723
Social Problems	0.6101

Thus eight indicators such as social value, social status, social process, social stratification, social solidarity, group dynamics, leadership behavior and social problems were finalized. The finalised schedule with eight major and 38 sub-indicators was administered to the respondents who were asked to give their responses on a five point continuum scale *viz.*, Most Prevalent (MTP), More Prevalent (MRP), Moderately Prevalent (MOP), Less Prevalent (LSP) and Least Prevalent (LTP) for which the scores given were 5, 4, 3, 2 and 1 respectively. Each indicator was measured by means of scoring procedure developed for the study. Overall social-dynamics of drip users was calculated by summing up the indicator wise score. Based on the total score the respondents were classified in to three groups' viz low, medium and high existence of social dynamics by taking mean and SD as measure of check. All the indicators were subjected for Principle Component Analysis and Factor Analysis to identify the factors of social dynamics. The scoring and quantification method followed by *Palmurugan (2002)* was used with necessary modification to apt for the study.

RESULTS AND DISCUSSION

The perceived existence of overall social-dynamics and its distribution among different categories of drip users is presented in Table 2.

Table 2. Overall social-dynamics of drip and non-drip users (N=120)

Category	Category-wise drip users						Total	
	Sugarcane (n=40)		Onion (n=40)		Leaf Banana (n=40)		drip users (n=120)	
	No	%	No	%	No	%	No	%
Low existence	4	10.0	3	7.5	8	20.0	15	12.5
Moderate existence	27	67.5	27	67.5	24	60.0	78	65.0
High existence	9	22.5	10	25.0	8	20.0	27	22.5
Total	40	100	40	100	40	100	120	100

Moderate to high level of perceived social-dynamics existed among majority (65% and 22.5%) of total drip users. Among three categories of drip users, sugarcane and onion growers had higher moderate level of social-dynamics (67.50% each) compared to leaf banana growers (60.00%).

Sugarcane cultivation needs active cooperation and interaction with various stake holders such as sugar factories, input dealers and fellow farmers which lead to high existence of social-dynamics among them. Onion is a short duration crop and highly sensitive to price fluctuation. This forced them to take timely decision at various stages, such as storage and marketing by consultations with fellow farmers, input dealers and commission agents. Due to increased interactions, social-dynamics indicators played significant role among these two categories of respondents. Moreover, installation of drip itself needs frequent contact with various agencies which may also contribute for higher

social-dynamics among three categories of drip users in general.

Apart from overall social dynamics analysis, each indicator was taken into consideration for further statistical analysis. Principle Component Analysis and factor analysis (with varimax rotation) have been used to group the indicators into factors based on the communalities observed. Principle component analysis was carried out with all the indicators and the results furnished in Table 3.

Table 3. Eigen values for social dynamics indicators

Component number	Eigen value	Cumulative variation (%)
I	2.357	29.468
II	1.487	48.051
III	1.117	62.016
IV	0.772	71.665
V	0.745	80.980
VI	0.612	88.633
VII	0.501	94.898
VIII	0.408	100.00

Table 4. Rotated factor (Varimax) matrix of each indicators

Social-dynamic indicators	Factors		
	1	2	3
Social value	0.732	-0.037	-0.009
Social status	0.847	0.032	-0.143
Social process	0.681	0. 239	-0.115
Stratification	0.425	0.199	0.620
Social solidarity	0.010	0.802	0.023
Group dynamics	0.149	0.753	0.181
Leadership behaviour	0.051	0.723	-0.149
Social problem	-0.243	-0.108	0.812
Eigen values	1.983	1.845	1.134
% of variation explained	24.785	23.060	14.171
Cumulative % variation explained	24.785	47.845	62.016

Table 3 could provide details of Eigen value and percentage of variance explained by the components. The components which are having more than one Eigen value were selected. Thus, from the eight components, three factors were extracted and these factors together explained a total variance of 62.02 per cent towards social dynamics. From the results it could be concluded that first three factors which are having more than one Eigen value are contributing 62.02 per cent variation towards social dynamics. The results of principle component analysis clearly indicated that there were

three factors which explained the maximum variation (62.02%) in social dynamics. Further, the factor analysis with varimax rotation was carried out. The results were presented in Table 4.

From Table 4, each factor column was scanned for identifying the indicators which are more significantly correlated with the particular factor. Thus, from each factor column, the indicators having a factor loading of more than 0.5 were selected (*Swathi lekshmi and Chandrakandan, 2005*) and grouped in Table 5.

Table 5. Factors-wise indicators with factor loading

Factors	Socio-indicators	Factor loadings
Factor 1	Social value	0.732
	Social status	0.841
	Social process	0.681
Factor 2	Social solidarity	0.802
	Group dynamics	0.753
	Leadership behaviour	0.723
Factor 3	Social stratification	0.620
	Social problem	0.812

The data in Table 4 revealed that the grouping of indicators under each factor with their factor loadings.

Factor 1 : This factor was identified as 'prime factor' as it explained 24.785 per cent of variation in social-dynamics. From the Table, it could be inferred that under factor 1, social status influencing the social-dynamics into greater extent with the highest factor loading of 0.841 followed by social value (0.732) and social process (0.681). Since, these factors primarily deal with system, structure and interaction of the society; it has been termed as '*Social Structure*' factor of social-dynamics in this study.

Social structure factor which includes social value, status and process were indicative factor of any society. Personality of any individual mainly depends with social structure in which he interacts with other people. An individual learning in a society is primarily through the process of socialization. Further, he or she acts in agreement with the rules of society based on the value system and experience gained from socialization process. Apart from ascribed social status, other components of social status such as position in society and respecting elderly and educated people were also learnt through socialization process. Thus, prevailed social value and social status were shaping the social process into great extent. Because of the above fact, three indicators viz., social value, social status and social

process were found to be interlinked with each other and have been loaded in the Factor 1.

From the above discussion, it could be interpreted that social-interaction factors are bound to have profound impact on their social dynamics. Similar results were reported by *Swathilekshmi and Chandrakandan (2005)* who reported that the socio-economic status of farmers had relatively higher factor loading among Shrimp growing farmers.

Factor 2: Among the total variation of 62.01 per cent, the second factor alone explained the social dynamics variation to the extent of 23.06 per cent. Thus, factor 1 and 2 together contributed 47.85 per cent variation in social dynamics (Table 4). From the results, it could be concluded that among the three indicators in factor 2, social solidarity has been found to manipulate the social dynamics to a greater extent with the highest factor loadings of 0.802 followed by group dynamics (0.753) and leadership behaviour (0.723). As these factors mainly deal with communication pattern and network of the society, it has been termed as *'Social Network'* factor.

Group dynamics essentially progress through interaction and network pattern between individuals in the society. If the group dynamics is to be strong enough in any society, it will accelerate the leadership and solidarity of the society. Therefore, these three indicators were interlinked with each other and significantly loaded in single factor namely Social Network factor. Hence, it could be interpreted that Social Network factor was bound to have profound impact on the social-dynamics and contributed for 23.06 per cent of total variance in social-dynamics.

Factor 3: Among three factors of social dynamics, third factor had been identified as territory factor since it explained only 14.171 per cent variation in social dynamics. In this factor, indicator such as social problem persuades the social dynamics in to a greater extent with the factor loadings of 0.812 followed by social stratification (0.620). While these two indicators are issue based indicators, this factor could be termed as *'Social Issue'* factor. Social stratification and social problems were two important indicators which decide the existence of any society and they are bound to have profound impact on their social dynamics and contributed for 14.171 per cent of total variance in social dynamics.

CONCLUSION

It could be concluded from the above analysis that social-dynamics of the drip users could be determined by the factors such as social structure, social network and social issue. Among these factors, social-structure factor accounted for the maximum percentage of the total variance on the overall social dynamics followed by social-network factor and social-issue factors.

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