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Avdhesh S Jha**



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Dr. Avdhesh S. Jha

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EDITORIAL

With the descending temperature and the chilling cool winter, this issue comes out with the research attitude of the potential researchers throughout the country in the different faculties. This issue enriches us with the inclusion of psychology, education, management, entrepreneurship, and technology supported with ambitions, motivation, belief and action of potential researchers.

To enhance and add to the knowledge of educational psychology Bhattacharya and Bose studies career aspiration vis-à-vis interpersonal relationship; Mukherjee and Mukherjee draws the locus of control, birth order and residence as predictors of general wellbeing; Chingtham verifies the relationship between socio economic status and job satisfaction of private school teachers; Rana and Solanki focus on the correlation of mental stress and related variables; Thakkar presents the effect of learning styles on learning achievement; Thokchom discuss the community participation in tourism development whereas Patil and Nagendra describes the effect of yoga on the triguna.

To add to management, entrepreneurship and technology, Singh talks of privacy concerns in facebook site; Manibombi devi talks of status of women entrepreneurship and micro finance; Butsara stresses on financial management features in emerging economies; Master elaborates on green accounting; Pandhal and Jha studies fairness and reciprocity; Mehta and Rami focus on savings, investment and economic growth in India; Jain, Gupta and Soni reveals the attributes for TPM implementation whereas Rajarajeswari and Sreekumar conducts performance evaluation of a wire mesh solar air heater.

Research is deeply rooted in social science, humanities and technology. With inclusion of variety of topics as such career aspiration, general wellbeing, socio economic status and job satisfaction, mental stress, learning styles and achievement, community participation, yoga, privacy concerns and facebook, women entrepreneurship and micro finance, financial management in emerging economies, green accounting, fairness and reciprocity, savings, investment and economic growth in India, identification of attributes for TPM implementation and solar air heater which is the need of the time, I am sure that this issue will be of much concern to all those interested in research, education and thus upliftment of society.

**Warm regards,
Avdhesh S. Jha
Chief Editor
Voice of Research**

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CAREER ASPIRATION VIS-À-VIS INTERPERSONAL RELATIONSHIP – A STUDY ON SINGLE AND IN-A-RELATIONSHIP STUDENTS
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Abstract

Career aspiration is the strong desire or goal to have a good career. Career aspiration refers to simply the goals that set out to achieve in either one's current profession or one's desired profession. An interpersonal relationship is an association between the two or more people that may range from fleeting to enduring. This association may be based on inference, love, solidarity, regular business interactions, or some other types of social commitment. The aim of the present investigation is to study career aspiration vis-à-vis interpersonal relationship of single and in-a-relationship students. Accordingly, a group of 60 single (30 male and 30 female) and 60 in-a-relationship (30 male and 30 female) students of 18 to 22 years age were selected as sample in this investigation. A General Information Schedule, Career Aspiration Scale, FIRO-B were used as tools. Findings revealed that single and in-a-relationship students differ among themselves in terms of career aspiration and interpersonal relationship. It may be helpful for the teachers, school counselors, career counselors to implement the findings by providing interpersonal skills development training programme in schools and colleges regarding career aspiration among the students.

Key words : Career Aspiration, Interpersonal Relationship, Single and In-a-Relationship Students

Career is the progress and actions taken by a person throughout a lifetime, especially those related to that person's occupations. It is a strong desire or goal to have a good career. It varies from individual to individual and can be divided into five categories, viz., traditional career success, security, expertise, freedom and balance. On the other hand, interpersonal relationship is a strong, deep or close association or acquaintance between two or more people that may range in duration from brief to enduring. Close relationship are sometimes called interpersonal relationship. Interpersonal relationships are formed in the context of social, cultural and other influences. Quality of interpersonal interaction influences consequent happiness and task engagement, strengthen the bond between people, encourage empathy and trust and create a sense of well being after a close interaction (Armstrong and Crombie, 2000). Individuals' value achievement and ambition in their romantic partners influence the educational and career trajectories (Giordano and Phelps, 2008). Besides this, career aspiration focuses on the interplay between individuals and the environments and then looks at that relationship over time (Rochelle, 2007). Role of interpersonal relationship in students' academic motivation, engagement and achievement depends on many factors, especially on career aspiration (Martin and Dowson, 2009). Cross sectional research implies a close relation of vocational interests, goals and trait yet little is known about their reciprocal development over time. Interests and goals are significantly related within time and have significant interactions across time (Hirsch, 2010). The study of interpersonal relationship involves several branches of the social sciences including such disciplines as sociology, psychology, anthropology. Interpersonal skills are extremely vital when trying to develop a relationship with another person. There are multiple perspectives to understand the inherent motivation to interact with others. Considering the above, the present investigation has been designed to study career aspiration in connection with interpersonal relationship of single and in-a-relationship students of Kolkata City.

Objectives

To study the career aspiration of students of single and in-a-relationship.

To study interpersonal relationship of students of single and in-a-relationship.

To study the correlation between career aspiration and interpersonal relationship.

Hypotheses

Students of single and in-a-relationship differ among themselves in terms of career aspiration.

Students of single and in-a-relationship differ among themselves in terms of interpersonal relationship.

There is a positive correlation between career aspiration and interpersonal relationship.

Sample : A group of 120 students (60 single and 60 in-a-relationship) were selected as sample in this investigation. The pertinent characteristics of the subjects are as follows :

1. Age range : 18 to 22 years
2. Gender : Equal gender ratio
3. Educational qualification : Higher Secondary
4. Willing to communicate

Tools used

General Information schedule : It consists of items, viz., name, address, age, gender, educational qualification, relationship status etc.

Career Aspiration Scale (Karen O'Brien, 2007) : It consists of ten statements answerable in a five point scale, viz., not at all true of me, slightly true of me, moderately true of me, quite a bit true of me and very true of me where high score indicates high career aspiration and vice-versa. The statements are comprised with the items which indicate the factor of leadership, achievement orientation and educational orientation.

FIRO-B (Will Schultz, 1958) : The Fundamental Interpersonal Relations Orientation Behaviour instrument is a personality assessment which measures how typically we behave with others and how you expect them to act towards us. It consists of 54 statements answerable in a six point scale.

Administration, Scoring and Statistical Treatment : A General Information Schedule, Career Aspiration Scale and FIRO-B were administered to the selected group of subjects by giving proper instruction. Data were collected and properly scrutinized. Scoring was done with the help of standard scoring key. Tabulation was done for each group and each test separately. Frequency and percentages were calculated for general information schedule. Mean and S.D. were calculated for other tests. Comparisons were made by applying t-test.

Results And Interpretation : The general characteristics data inserted in Table – 1 reveal the general characteristic features of the subjects, under study.

Table – 1

General characteristic features of the subjects under study

General characteristic	Single		In-a-relationship	
Age (mode)	21 years		22 years	
Gender	Frequency	Percentage	Frequency	Percentage
Male	30	50.00	30	50.00
Female	30	50.00	30	50.00
Edu. Qua.				
Under-graduate	25	41.67	28	46.67
Graduate	35	58.33	32	53.33

Data inserted in Table – 2 reveals the career aspiration of students of single and in-a-relationship. From the data it can be said that career aspiration level of both the group are high but it is comparatively higher among the students who are in-a-relationship than that of the single. Analysis of data further reveals that both the group want to continue their study after finishing the basic level of education which is needed for a particular job. They also want to devote energy to become an expert and also want to attain leadership. The students who are in-a-relationship have a desire to secure their relation in front of the existing scenario of the society. Thus, the Hypothesis – I which postulates, “Students of single and in-a-relationship differ among themselves in terms of career aspiration” – is accepted in this investigation.

Table – 2

Comparison between the students of single and in-a-relationship in terms of Career Aspiration

Category	Career	Aspiration	of Students	t-value
Single	N	Mean	S.D.	
Single	60	36.60	5.58	2.08*
In-a-relationship	60	40.92	3.59	

Score range : 10 to 50

High score indicates high career aspiration and vice-versa
* p < 0.05

Comparison was also made between the students of single and in-a-relationship in terms of interpersonal relationship. From the mean score it can be said that the total need score of single group is medium low which indicates that the interaction in all the areas of control, affection and selection for these persons depend on a selective basis. They are choosy about how, when and where association with others is done and they are cautions about sharing authority. Very few close relationships are only important for them and usually they prefer to concentrate on the more impersonal demands of the task instead of the more personal ones. The total need score of the students of in-a-relationship is found to be towards medium high, which means that these students interact with others in all areas of inclusion, control, affection. They

are likely to enjoy fair amount of team work and to value forming warm one-to-one relationship. Analysis of data further reveals that the students who are in relationship tend to have more expressed and wanted interpersonal need than the single students. Thus the Hypothesis – II, which states, “Students of single and in-a-relationship differ among themselves in terms of interpersonal relationship” – is accepted in this investigation.

Table – 2

Comparison between the students of single and in-a-relationship in terms of interpersonal relationship

Category	Interpersonal	Relationship	of Students	t-value
Single	N	Mean	S.D.	
Single	60	20.66	4.73	2.34*
In-a-relationship	60	25.63	4.55	

Score range : 10 to 50

High score indicates good interpersonal relationship and vice-versa
*p < 0.05

Data inserted in Table – 3 reveals the value of coefficient of correlation between career aspiration and interpersonal relationship. It indicates positive correlation between these two. Thus the Hypothesis – III, which states, “There is a positive correlation between career aspiration and interpersonal relationship” – is accepted in this investigation.

Category	Coefficient of Correlation
Career Aspiration	0.61
Interpersonal Relationship	

Concluding Remarks : In conclusion it can be said that the students who are in-a-relationship have comparatively higher career aspiration and also higher interpersonal relationship than those of the students who are in single category. Not only this, there is a positive correlation between career aspiration and interpersonal relationship. In this context it can be said that interpersonal skill development training program may help the students to acquire high career aspiration. Counseling sessions may also help the students to aware about the need for interpersonal skill development of the students. School counselors and career counselors may take initiative to show the students how career aspiration is influenced by interpersonal relationship. Measures may be taken regarding career awareness program and also for proper development of interpersonal skills of the students.

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LOCUS OF CONTROL, BIRTH ORDER AND RESIDENCE AS PREDICTORS OF GENERAL WELLBEING WITH SPECIAL REFERENCE TO TRIPURA**Voice of Research**

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Abstract

This study focuses on the Locus of Control, Birth Order and Residence as predictors of General Wellbeing with special reference to Tripura by taking 400 degree level students from different degree colleges and universities of Tripura state. Review of literature demonstrates that different factors associated with general wellbeing operate differently in different cultures and races and since there is dearth of such systematic study under Indian set up, it is appropriate to investigate empirically that whether or not locus of control, birth order and residence independently or in interaction with each other are accountable for differences in General Wellbeing among students. The following conclusions were drawn on the basis of analysis of data like Locus of control significantly influences general wellbeing of students, internally controlled students were found superior on general wellbeing than externally controlled students. Birth order of the students seems to have significant influence on general wellbeing. First born students were found higher on general wellbeing than later born students. Residence does not account for substantial amount of variance on general wellbeing of students. Urban or rural students have yielded equal outcome on the scores of general wellbeing. Locus of control and birth order appears to interact to yield significant results on general wellbeing. Locus of control and residence and birth order and residence of the students do not appear to interact to yield significant results on general wellbeing. Locus of control, birth order and residence of the students do not appear to interact with reference to general wellbeing of the students of Tripura in particular.

Key words : Locus of Control; General Wellbeing

Identification of possible correlates of general wellbeing provides a clue regarding the antecedents/determinants of general wellbeing. Perhaps the most consistent and reliable correlates of wellbeing pertain to central role played by people's goals, coping efforts, and dispositions (Diener, Suh, Lucas and Smith, 1999). The present study empirically investigates the possible effect of locus of control, birth order and residence on general wellbeing. Wellbeing is the degree to which an individual judges the overall quality of his or her life as a whole in a favourable way (Veenhoven, 1984).

A locus of control is a person's belief about how much power one has over the events in one's life. According to psychologist Julian Rotter, who formulated the concept in the 1950s, the locus of control is a dimension of personality; it helps explain one's traits and behavior. An internal locus of control is the belief that the course of one's life is largely up to oneself. Those with an external locus of control regard the events in their lives as occurring regardless of their own efforts. People who have an internal locus of control tend to be less influenced by others, more politically active, and more motivated to achieve. Many researchers believe an internal locus of control is more healthful than an external one.

Empirical findings have shown that internals are more cognitively efficient, more alert to the potential meaning of their experiences and less easily coerced by environmental forces. This suggests the importance that an internal locus of control has for effective coping behaviour. If a person is able to quickly assess the options available to him in a challenging situation, he should be able to cope more effectively than if he were less absolute about his choices; and if he believed that he was able to effectively act in his own behalf, even consequences would have a less debilitating effect upon him. Therefore locus of control may have an impact on wellbeing of the human race.

Different factors associated with general wellbeing operate differently in different cultures and races and since there is dearth of such systematic study under Indian set up, it is appropriate to investigate empirically that whether or not locus of control, birth order and residence independently or in interaction with each other are accountable for differences in general wellbeing among students. Verma and Verma (1989) are of the view that general wellbeing is "the subjective feeling of contentment, happiness, satisfaction with life's experience and one's role in the world of work, sense of achievement, utility, belongingness and no distress, dissatisfaction or worry etc".

A study by Lee KH, Yoon DP. 2001 explores factors that influence the general well-being (anxiety, depression, positive well-being, self-control, vitality, and general health) of low-income Korean immigrant elders by interviewing 206 older adults living in Los Angeles County and Orange County, California. Ordinary least squares regression results reveal that lack of English proficiency and longer residence in the United States were significant predictors of higher anxiety, higher depression, lower self-control, lower vitality, and lower general health among Korean immigrant elders. Losing a spouse was a significantly negative factor in vitality. Financial problems were significantly associated with lower positive well-being. Social environment and social support were the significant factors in lower anxiety, lower depression, higher positive well-being, higher self-control, and higher vitality. The findings of this study show that low-income Korean immigrant elders are at high risk for psychological and physical health problems influenced by difficulties with the acculturation or adjustment and socioeconomic stress of living in a new society. The study discusses essential implications for culturally competent social work practice among low-income Korean immigrant elders. This led the researcher to consider resi-

dence as another variable to study as a predictor of wellbeing. Different factors are associated with general wellbeing that operate differently in different cultures and races and since there is dearth of such systematic study under Indian set up, it is appropriate to investigate empirically that whether or not locus of control, birth order and residence independently or in interaction with each other are accountable for differences in Wellbeing among students.

Objectives of the Study

The following objectives were set forth in the present investigation:-

To study the impact of locus of control, birth order and residence on general wellbeing of students.

To investigate the interaction effects of locus of control and birth order, locus of control and residence and birth order and residence on general wellbeing of students.

To study the interaction effects of locus of control, birth order and residence on general wellbeing of students.

To study the impact of locus of control, birth order and residence on general wellbeing of students.

To investigate the interaction effects of locus of control and birth order, locus of control and residence and birth order and residence on general wellbeing of students.

To study the interaction effects of locus of control, birth order and residence on general wellbeing of students.

Hypotheses

The specific research hypotheses have been detailed in line with the objectives mentioned just above. The following hypotheses were framed for verification in the present study:-

There would be a significant difference in internally controlled and externally controlled students on general wellbeing.

There would be a significant difference on general wellbeing among first born and later born students.

There would be a significant difference on general wellbeing among urban and rural students.

There would be a significant interaction effect of locus of control and birth order on general wellbeing of students.

There would be a significant interaction effect of locus of control and residence on general wellbeing of students.

There would be a significant interaction effect of birth order and residence on general wellbeing of students.

There would be a significant interaction effect of locus of control, birth order and residence on general wellbeing of students.

Sample : All regular students studying in graduation and post graduation level of 4 different colleges and 2 different universities of Tripura located in Agartala West district are considered in this present investigation. The sample for the present study consists of 400 students approx. It included both male and female students (18 – 24) of Arts, Maths, languages, Science and Commerce Streams. Locus of control, birth order and residence were independent variables and general wellbeing was the dependent variable.

Procedure : PGI General Wellbeing Measure (Verma, Mahajan and Verma, 1989) and Levenson’s Locus of Control Scale were administered to the university and college students in their class room settings. Before administering the tests, the objectives of the study were explained to them. They were requested

to extend their co-operation by responding to each item honestly, sincerely and truthfully. Thereafter, procedure for answering each item was explained. On completion, the tests were collected and scored as per instructions given in the manual. The obtained data were analyzed using appropriate statistical techniques. The results were interpreted in line with the objectives stated.

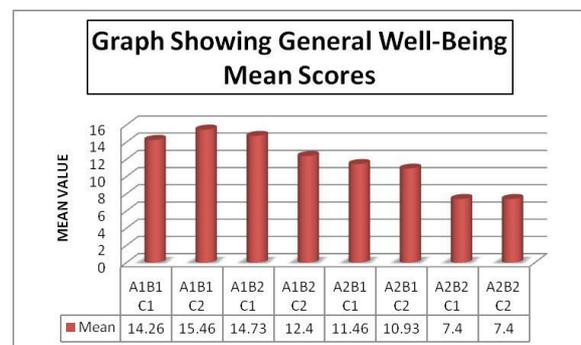
Statistical Treatment : To study the main and interaction effect of locus of control, birth order and residence on general wellbeing of University students, a 2 x 2 x 2 factorial design was employed. In this design each of the three independent variables were varied at two levels. Residence and birth order are dichotomous variables, where as locus of control was classified into two groups (internal and external locus of control) following the opposite extreme group technique of 27% upper and 27% lower as cutting points of the distribution of LOC scores. Locus of control was designated as ‘A’ factor, birth order as ‘B’ factor and residence as ‘C’ factor. Internal locus of control, first born and urban University students were designated as A2, B2 and C2 respectively. Subjects were thus kept in eight cells. 15 Subjects were assigned to each cell to have equal size of N in each group.

Result & Discussion : The number of respondents of different possible combinations of the three independent variables namely locus of control(A), birth order(B) and residence (C) along with mean scores on general wellbeing are presented in Table 1.

Table – 1
Number of respondents and mean general wellbeing scores of different combination of groups

Groups	No	Mean
A1B1C1	15	14.26
A1B1C2	15	15.46
A1B2C1	15	14.73
A1B2C2	15	12.40
A2B1C1	15	11.46
A2B1C2	15	10.93
A2B2C1	15	7.40
A2B2C2	15	7.40

As per factorial design of 2 x 2 x 2, three way analysis of variance was performed on the scores of general wellbeing to ascertain the main and interaction effects of three independent variables namely locus of control, birth order and residence.



The ‘F’ ratios computed for different main effects and interaction effects have been shown in Table 2.

Table – 2
Summary of three ways ANOVA for wellbeing (2 x 2 x 2) factorial design.

Source of Variation	Sum of Squares	df	Mean Square	F-ratio
Main effects				
Locus of Control (A)	752.208	1	752.208	68.25*
Birth Order (B)	195.074	1	195.074	17.70*
Residence (C)	5.208	1	5.208	0.472*
Two way interactions				
Locus of Control X Birth Order(AXB)	46.875	1	46.875	4.245**
Locus of Control X Residence(AXC)	0.675	1	0.675	0.061*
Birth Order X Residence(BXC)	16.87	1	16.87	1.53
Three way interaction				
Locus of Control X Birth Order X Residence (A X B X C)	4.012	1	4.012	0.364
SSw	1235.07	112	11.02	
Tss	2255.99	119	18.9	

*P < 0.01; ** P < .05.

Results Table 2 depicts that the obtained value of F (68.25) is highly significant. The results indicate that locus of control has significant main effects on general wellbeing of students. It may be concluded that both the groups (A1 and A2) differed significantly. Further, the mean score of internally controlled group it came out to be 14.21 and for externally controlled group it came out to be 9.3. Obviously, the mean difference was in favour of internally controlled students. Thus, it can be interpreted that internally controlled students are higher on general wellbeing than their counterpart externally controlled students. Hence the hypothesis that, "There will be significant difference in externally controlled and internally controlled students on general wellbeing has been accepted in this study.

F-ratio for birth order was found out to be 17.70 which is significant at .01 level of confidence. It implies that first born group of students differs significantly than later born group of students. At a glance the mean scores indicates that the first born group of students (M= 13.03) is higher in comparison to later born (M= 10.48). Obviously the first born groups of students are higher on wellbeing than later born group of students. Hence, the research hypothesis stating that, "There will be significant difference on general wellbeing among first born and later born students" stands accepted.

The main effect of residence was analyzed over two levels of Locus of Control (A) and Birth Order (B). Table 2 depicts that F-ratio for residence came out to be 0.472 which is not significant. It indicates that the main effect of residence was not significant. Thus it can be concluded that as for as general wellbeing is concerned residence do not play a significant role. Hence, the research hypothesis stating that, "There will be significant difference on general being among urban and rural students" stands rejected.

On the perusal of Table 2, it is clear that F-ratio for A X B interaction came out to be 4.245 which is significant at 0.5 level. In other words difference between the mean of A1 and A2, (Internally controlled and externally controlled) for first born group of students (B1) is significantly different from the difference between the mean of A1 and A2, (Internally controlled and externally controlled) for later born group of students (B2). Thus it can be concluded that A X B interac-

tion is significant. Hence, the hypothesis that, "There will be significant interaction effects of locus of control and birth order on general wellbeing of students" has been accepted in this study. The mean scores of A X B interaction as shown in Table 3 indicates that internally controlled and first born students surpassed all other groups of students on general wellbeing (M= 14.86). Externally controlled and later born students were found lowest among the groups (M= 7.40). A scrutiny of Table 2 indicates that F-ratio for A X C interaction came out to be 0.061 which is not significant at any level. As such the difference between means of internally controlled (A1) and externally controlled (A2) for urban group of students (C1) is not different from the difference between the mean of internally controlled (A1) and externally controlled (A2) for rural group of students (C2). Thus, the research hypothesis that, " There will be significant interaction effect of locus of control and residence on general wellbeing of students" has been rejected in this study.

Table – 3
Means and Mean differences of students indicating A X B interaction

Sl No.	Group	Mean	Mean Difference
I	A1B1	14.86	I-II= 14.86-13.56= 1.30 I-III= 14.86-11.20= 3.66
II	A2B2	13.56	I-IV= 14.86-7.40= 7.46
III	A2B1	11.20	II-III= 13.56-11.20= 2.36 II-IV= 13.56-7.40= 6.16
IV	A2B2	7.40	III-IV= 11.20-7.40= 3.80

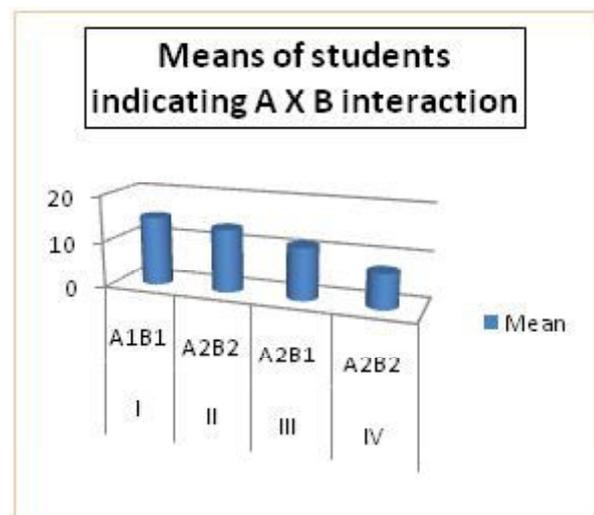


Table 2 indicates that F-ratio for B X C interaction is 1.53 which is not significant at any level. It indicates that difference between the means of first born (B1) and later born (B2) for urban students (C1) is not significantly different from the difference between the means of first born (B1) and later born (B2) for rural students (C2). Thus, the research hypothesis stating that, "There will be significant interaction effect of birth order and residence on general wellbeing of students" has been rejected in the present study. The higher order i.e. three factor interaction effects of Locus of control (A) X Birth order (B) X Residence (C) was analyzed using three way

analysis of variance. The Table 2 depicts that 'F' ratio for three way analysis of variance came out to be 0.364 which is not significant at any level. Thus, the research hypothesis that, "There will be significant interaction effect of locus of control, birth order and residence on general wellbeing of students" stands rejected. The research on general wellbeing has become an area of interest among researchers and practitioners in many fields during last few decades. To date, researchers have identified numerous personal background characteristics that appear to be associated with general wellbeing. Review of literature on wellbeing suggests that the research on locus of control and birth order in relation to wellbeing has been scanty and tardy. As reported earlier the present study was carried out on 400 post graduate students of different Colleges and Universities, Agt using locus of control, birth order and residence as independent variables and general wellbeing as dependent variable. The result shows that internally controlled group of students are significantly higher on general wellbeing than externally controlled group of students. It may be because people high on internal locus of control are more active in attempting to manipulate their environment, while extends are passive in manipulating their environment (Stadford and Govier, 1991 cited in Kulshrestha and Sen, 2006). Internals, believe, they control their own destiny. Therefore, they act to take control of events in contrast to individuals with external locus of control. Individuals with external locus of control feel powerless in terms of controlling their success or failure, Kulshrestha and Sen, (2006), observed that those with internal locus of control is more positive behaviour and outcomes then holding on external locus of control with the results internals have definite goal in sustaining life. The findings of the present study are also indirectly supported by the studies of Epstein and Mocpartland (1977) in which, they demonstrated that students perceptions of an internal locus of control experienced greater depression leading to low wellbeing, Kulshrestha and Sen (2006) also found that internals are significantly better on subjective wellbeing than externals. The second main effect related to birth order was found significant revealing that first born and later born group of students differed significantly. First born group of students was found higher on general wellbeing in comparison to later born students. Although, the research related to the effect of birth order on general wellbeing is rare and scanty, yet some indirect support may be provided by the studies conducted on this field. Price (1969) reported that first borns are less found of Cuddling, are easier to train work harder at school and set higher standards for them. Further more, they are more serious, methodical, law abiding, tidy, less impulsive, given more responsibility at school, more nervous and less happy. The study reported above depict that first borns are significantly superior on some of the components on general wellbeing i.e. pleasant affect, life satisfaction and domain satisfaction. Farly, Smart and Brithan (1976) found birth order to be significant factor in academic achievement and attainment of eminence. Schulman and Mosak (1977) in summarizing Adler's description of the effect of birth order have said, "Birth order is not absolute determinant, only on influence. The reaction of parents to child is at least as important.

The third main effect of residence was found non-significant. The mean scores of both the groups were found identical, meaning there by that general wellbeing has nothing to do with urban or rural background of students. It may be because due to modernization and globalization that the life styles of rural population has changed and have come at par with the urban population. There is thus, little difference in the environment of urban and rural areas which resulted in non-significant difference in wellbeing. The interaction effects of locus of control, birth order and residence did not emerge as significant meaning thereby that the interaction effect is redundant. The three factor interaction effects revealed that interaction between locus of control, Birth order and residence is not significantly related to general wellbeing. The result need to be probed further by employing different samples and tools. However, the results reported above do not get empirical support because similar research evidences are locking on general wellbeing.

Conclusion : The following conclusions were drawn on the basis of analysis of data: Locus of control significantly influences general wellbeing of students. Internally controlled students were found superior on general wellbeing than externally controlled students. Birth order of the students seems to have significant influence on general wellbeing. First born students were found higher on general wellbeing than later born students. Residence does not account for substantial amount of variance on general wellbeing of students. Urban or rural students have yielded equal outcome on the scores of general wellbeing. Locus of control and birth order appears to interact to yield significant results on general wellbeing. Locus of control and residence and birth order and residence of the students do not appears to interact to yield significant results on general wellbeing. Locus of control, birth order and residence of the students do not appears to interact with reference to general wellbeing.

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SOCIO ECONOMIC STATUS AND JOB SATISFACTION OF PRIVATE SCHOOL TEACHERS IN MANIPUR

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Abstract

Life in private schools is different. Being fully independent management, the teachers are expected to be more committed and compassionate. This paper examines the socio economic status and job satisfaction of private school teachers. The pressure on teachers of low socio economic status, professional difficulties, inadequate service condition and higher responsibilities and less salary, the problems found by the study.

Key words : Private school teachers, condition of services

Private school have played a major role in the development of education system. Such schools are being managed by different types of organisations e.g, religions associations, registered trusts and also by various communities. Teacher in private schools profoundly appreciate the eternal dimensions of their work, for they nourish not only the minds but also the hearts and souls of their students. Serving in schools that emphasize a child's complete development, private school teachers have privileged opportunity to transmit the core academic skills as well as the lessons that count most in life: lessons about spirituality, love, values, and the wonder of creation, the existence. The conditions of service of private school teachers working under several private schools are far from satisfactory. They have little security of tenure and no pensionary benefits and sometimes not even a contributory provident fund; their remuneration is generally lower than that given to teacher of corresponding status under government schools. In many cases, they do not even receive the amount which is supposed to have been paid to them because the managements, who are unable to raise popular contributions, often try to produce the matching contributions required of them under the grant-in-aid rules by an illegal and unacknowledged cut in teacher's salaries.

Objectives of study

To study the socio economic status and job satisfaction of private school teachers.

To find out the reasons for discontinuing service.

Method of Study

The stratified random sample technique was used to select 200 private school teachers and 40 principals from 40 different private schools in Imphal East, Imphal West and Thoubal district of Manipur. All the private schools were affiliated to Board of Secondary Education Manipur. Survey method was adopted for the study. The tools used for the study were sought through two questionnaires, one for teachers and one for principals. Statistical techniques like chi-square and percentage were used to analyse the data.

Table - 1

Social status of private school teachers is very low

Categories	Observed frequency	Chi-Square frequency	Chi-Square
Strongly Agree	56	40	6.4
Agree	72	40	25.6
Undecided	10	40	22.5
Disagree	30	40	2.5
Strongly Disagree	32	40	1.6
Obtained =			58.6

From the table 1, it is observed that the obtained chi-square is 58.6 and the table value of the chi-square at df & 0.05 level of

significance is 9.488 & 0.01 level of significance is 13.276. Because the obtained chi-square is more than the table value of the chi-square, the hypothesis is rejected. 64.02% of the teachers support that the social status of private school teachers is very low. Also 65.01% of the principals support the same statement.

Table - 2

Economic status of private school teachers is very low

Categories	Observed frequency	Chi-Square frequency	Chi-Square
Strongly Agree	66	40	16.9
Agree	86	40	52.9
Undecided	10	40	22.5
Disagree	26	40	4.9
Strongly Disagree	12	40	19.6
Obtained =			116.8

From the table 2, it is observed that the obtained chi-square is 116.8 and the table value of the chi-square at 4df & 0.05 level of significance is 9.488 & 0.01 level of significance is 13.276. Because the obtained chi-square is more than the table value of the chi-square, the hypothesis is rejected. 76.01% of the teachers support that the economic status of private school teachers is very low. Also 70.03% of the principals support the same statement.

Table - 3

There is no professional satisfaction of private school teachers

Categories	Observed frequency	Chi-Square frequency	Chi-Square
Strongly Agree	44	40	0.40
Agree	66	40	16.90
Undecided	18	40	12.10
Disagree	50	40	2.50
Strongly Disagree	22	40	8.10
Obtained =			40.00

From the table 3, it is observed that the obtained chi-square is 40.00 and the table value of the chi-square at 4df & 0.05 level of significance is 9.488 & 0.01 level of significance is 13.276. Because the obtained chi-square is more than the table value of the chi-square, the hypothesis is rejected. 55.03% of the teachers support that the teachers do not get professional satisfaction in the private schools. Also 60.04% of the principals support the same statement.

Table - 4

Service conditions of private school teachers is not adequate

Categories	Observed frequency	Chi-Square frequency	Chi-Square
Strongly Agree	64	40	14.4
Agree	78	40	36.1
Undecided	14	40	16.9
Disagree	32	40	1.6
Strongly Disagree	12	40	19.6
Obtained =			88.6



From the table 4, it is observed that the obtained chi-square is 88.6 and the table value of the chi-square at 4df & 0.05 level of significance is 9.488 & 0.01 level of significance is 13.276. Because the obtained chi-square is more than the table value of the chi-square, the hypothesis is rejected. 71.02% of the teachers' support that the service conditions of private school teachers is not adequate. Also 70.02% of the principals support the same statement.

Table - 5
Committed and qualified people do not turn up to private schools because of higher responsibilities and less salary

Categories	Observed frequency	Chi-Square frequency	Chi-Square
Strongly Agree	48	40	1.6
Agree	82	40	44.1
Undecided	16	40	14.4
Disagree	40	40	0
Strongly Disagree	14	40	16.9

Obtained = 77.00

From the table 5, it is observed that the obtained chi-square is 77.00 and the table value of the chi-square at 4df & 0.05 level of significance is 9.488 & 0.01 level of significance is 13.276. Because the obtained chi-square is more than the table value of the chi-square, the hypothesis is rejected. 71.01% of the teachers' support that committed and qualified people do not turn up to private schools because of higher responsibilities and less salary.

Table - 6
Pay Scales of Private School Teachers

Lowest	3500	to	5000
Highest	5000	to	7000

The lowest salary of private school teachers is 3500 and the highest salary 7000. Thus the salary of private school teachers is very low.

Table - 7
Pay Scales of Private School Principals

Lowest	6000	to	8000
Highest	8000	to	15000

The lowest salary of private school principals is 6000 and the highest salary 15000. Thus the salary of private school Principals is very low.

Conclusions

On the basis of the results drawn and discussion with the teachers and principals of private schools, the following conclusions and suggestions are made for the further necessary action of the higher authorities :

- The society and community considered the private schools teachers as a unemployment person.
- Employment provident fund and minimum basic pay scale not applicable yet.
- Higher responsibility and less salary.
- Disappropriate qualification and standard of teaching.
- More involvement in non-academic and academic activities.

No laws or provisions for service conditions.
 The salary of the private school teachers is from Rs. 3500 to 7000 and for the principals also from Rs. 6000 to 15000. Thus, the economic status of the private school teachers is becoming very low.

Suggestions

The staff of private school should be brought under the employment provident fund, which is already applicable compulsory in the private schools.

The salary status of the private school teachers is required to make improvement. There should be a fixed regionable maximum basic pay scale.

To avoid overload of teachers, every teacher may be equally treat. There should be no stress or train on any individual.

For extra work for teachers and some extra allowances from the school authorities.

Provisions for service rule from the government and management side for the betterment of the private school teachers.

Organised a private school welfare association for the evaluation and monitoring various academic activities of private schools.

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MENTAL STRESS OF HIGHER SECONDARY STUDENTS IN RELATION TO CERTAIN VARIABLES

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Abstract

Stress is a psychological condition where a person feels tension and anxiety. An individual under stress is not able to have harmonious relations with the society. He may have also difficulty to control himself. This undue stress may also cause hyper-tension and depression. The paper discusses about mental stress and its consequences.

Key words : Mental stress, adolescence, stress

Sometime before, college or school days were considered the best years of one's life. These days used to be relaxed and tension free but now-a-days students' face depicts a different story. They are now not care free. During the time of examination, a special cell is constructed to help and counsel the students. In addition, there are reports in newspapers about suicides of students before and after the examination. There may be different reasons for increasing cases of stress. Technological development and fast life style have aggravated the condition. The researcher has in this study tried to know about various facts related with stress.

Stress at Adolescence Level/ Stage : The students of 11th and 12th standards belong to adolescent stage of human span of life. Adolescence is a transitional period and it is the bridge between childhood and adulthood. It is the time of rapid development of growing to sexual maturity, discovering one's physical self, defining personal value and finding one's vocational and social direction. Age of adolescence is the age of identity formation where occupational, educational and personal contexts develop. During this period social expectation of the individual is drastically under modification.

How to recognize Stress? The indicators of experiencing stress may be General irritability, Elevated heart rate, Increased blood pressure, Increased accident proneness, Trembling, Insomnia, Indigestion, Pain in neck and lower back, Changes in appetite or sleep pattern, Speaking loudly, Remaining silent or aloof, Quarrelling or abusing, Disturbed eating patterns, Floating anxiety-anxious feeling for no specific reason. The term that is of prime importance to the study are explained below

Stress : Stress is a non-specific demand on the individual's body or mind to adapt a change physically or psychologically. **Causes of Stress :** There are several factors causing stress. In the year 1999, Desai classified stressors into three major categories viz. **Physiological Causes :** The physiological category includes genetic and congenital factors, life experience, biological rhythms, sleep, posture, diet, fatigue, muscular tension, and diseases of adaptation. **Psychological Causes :** The psychological causes comprised nine elements; perception, emotion, situation, experience, sensation, decisions, memory, motivation, cognition and appraisal.

Environmental Causes : This category of stressors consists of those factors which originate from the environment like ambient environment, physical events, social events, and biotic events. In this research, the researcher is concerned with the mental stress of the higher secondary students in relation Peer group pressure, Teacher's pressure and Parent's pressure

Objectives : To identify the factors causing stress among higher secondary students. To study stress among higher secondary students due to academic pressure. To study stress among higher secondary students due to peer group pressure. To study stress among higher secondary students due to par-

ents' pressure. To compare stress among students English medium schools. To compare stress level among students of Gujarati Medium schools. To compare stress level among students of English and Gujarati medium schools

Research Questions : The researchers made attempt to answer the following research questions. Which types of stress do the students feel due to academic pressure? Which types of stress do the students feel due to peer group pressure? Which types of stress do the students feel due to parents' pressure? What is the stress level among the students of Gujarati medium schools? What is the stress level among the students of English medium schools?

Rationale of the Study : The researchers themselves as students had undergone stress and as a teacher had seen many students suffering from stress or tension. That is why the researchers wanted to know the reasons of stress of higher secondary students so that after diagnosis, steps can be taken to rectify the problem. The researchers themselves are also teachers. The researchers have observed many stress related problems among the students like nervousness, worry, tension, anger, loneliness and quarrelsome nature. Sometimes the students try to commit suicide due to too much stress.

Research Design : The present study is a descriptive study as the researchers have collected data through a survey. The purpose of the research is to study the different stress levels among the higher secondary students. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlation methods. The population of the study comprises of all the Higher Secondary Students of Kheda district in Gujarat. The researchers have selected the sample through stratified random sampling. The researchers have selected 20 students from each of the three English medium schools and 20 students from each of the three Gujarati medium schools of Nadiad District. For the present study the researchers used the following self-constructed tools: 1) Questionnaire for Students, 2) Questionnaire for Teachers, and 3) Questionnaire for Parents

(1) Questionnaire for Students

(a) Close Ended Questions : They were about stress level of the higher secondary students. There were 35 close ended questions in which the students had to tick mark the answer 'Yes' or 'No' in the questionnaire

(b) Open ended Questions : They were ten questions related to different stress levels of the students in which they had to present their own ideas and experience about stress. In this questionnaire for students multiple choice types of 35 questions and 10 open ended questions were given. These questions were related to students' stress in the higher secondary schools. In the present study the researcher gave the questionnaire to the 20 students from three English Medium

schools each and 20 students from three Gujarati Medium schools each.

(2) Questionnaire for Teachers : This questionnaire consisted of ten open ended questions. These questions were related to teachers' observation and experience about the students' stress in the Higher Secondary Schools of both the mediums. The researchers got the questionnaire filled up by the ten teachers from Higher Secondary Schools in general.

(3) Questionnaire for Parents : This questionnaire consisted of ten open ended questions. These questions were related to parents' observation and experience about the students' stress in the Higher Secondary Schools of both the mediums. The researchers got the questionnaire filled up by the ten parents.

Data Collection Procedure

Stage – 1 : The researchers prepared the tools for data collection and validated the same. The tools were shown to the experts and thereby their suggestions and comments were incorporated and tools were validated. **Stage – 2 :** The researchers personally visited and sought permission from three English Medium schools and three Gujarati Medium schools

Stage – 3 : The researchers administered the questionnaire to students of Higher Secondary Schools of Gujarati and English Medium **Stage – 4 :** The researchers administered the questionnaire to parents whose children are studying in Higher Secondary Schools of Gujarati and English Medium. **Stage – 5 :** The researchers administered the questionnaire to teachers who teach in Higher Secondary Schools of Gujarati and English Medium.

Data Analysis, Interpretation and Discussion : Once the data are collected and organized in a precise way, the next step in research process is the analysis and interpretation of the same in order to get a meaningful picture out of the raw information collected. Analysis of data involved the breaking down of existing complex factors into simpler parts and combining the parts into new arrangements for the purpose of interpretation. Data have been studied from as many angles as possible, to find newer facts. Interpretation of data is the process by which the analyzed data are given meaning, significance to find out whether or not the answer to the original problem is obtained. Careful and critical thinking is essential to safeguard against misinterpretation. In the present study, the researchers analyzed the data with the help of content and percentage analysis.

Interpretation of the Questionnaire for Students from both English medium and Gujarati medium Schools

66.99% students feel stress while coping up with the studies whereas 33.01% students do not feel stress while coping with the studies. 54.99% students get enough time to relax and enjoy whereas 45.01% students do not get enough time to relax and enjoy. 43.83% students get enough time to play with their friends daily whereas 56.17% students do not get enough time to play with their friends daily. 64.17% students get enough time to watch movies once in a month whereas 35.83% students do not get enough time to watch movies once in a month. 41.64% students feel headache often whereas 58.36% students do not feel headache often. 53.33% students have made a good combination of studies and play whereas 46.67% students have not made a good combination of studies and play. 61.67% students are compared with their better performing friends by their parents whereas 38.33% students are not compared with their better performing friends by their parents. 83.33% students want to study due to their own interest whereas 16.67% students do not want to study due to their own interest. 10.83% students study due to the pressure of their parents whereas 89.17% students do not study due to

the pressure of their parents. 83.33% students get enjoyment in their study whereas 16.67% students do not get enjoyment in their study.

Interpretation of Open ended questions for Students from both English medium and Gujarati medium Schools

45.83% students of English medium and Gujarati medium schools feel jealous, shame and bad. 42.49% students feel happiness and encouraged. 10.83% students feel the desire to work hard and 0.83 students feel proud when their friends score more marks than them. 87.83% students of English medium and Gujarati medium schools feel bad, shame, angry, insulting, hesitating and embarrassed, 7.72% students think to work hard and be courageous and 4% students feel to take revenge when their peers laugh at them when they are unable to answer correctly. 71.66% students of English medium and Gujarati medium schools feel bad, angry, guilty, insulted, embarrassed and shame, 20% students feel to come early, 5% students feel to accept the mistake and 3.34% students feel to go back home when they come late and are not allowed to enter the class. 71.25% students of English medium and Gujarati medium schools feel bad, shame, guilty, insulted, angry, fear, confusion and repentant, 4.58% students think to give proper reason, 5% students feel good and 19.17% students feel to accept the mistake and be regular next time when they are scolded by the teacher in the classroom for not doing the homework. 7.5% students of English medium and Gujarati medium schools feel bad, embarrassed and insulted, 66.67% students feel happiness and encouraged, 25.83% students feel pride and confidence when their teachers praise them in the classroom.

Interpretation of questions of parents' interviews : 30% parents think that 11th and 12th standards are extremely important for them and their children because it is very important to enter into the most important profession. As 11th and 12th standards are base to go for the higher education. 20% parents think that these standards are the base of their future studies whereas 50% parents think that it is very important to build their bright career and prosperous life.

According to the parents' interview about their son/daughter's stress level in the 11th and 12th stds, 25% parents believe that it spoils their mental and physical health, 30% parents believe that they feel stress and tension, 05% parents believe that it is the base of their future education, 20% parents think that it is necessary to work hard, 10% parents think that their wards diverts their mind due to T.V and internet whereas 10% parents believe that their wards need to have stress. 80% parents feel depression and bad whereas 20% parents try to motivate their children when they do not meet their expectations. 20% parents try to find out the reason and solve their problems, 70% parents feel bad, anger and blame the teachers whereas 10% parents feel to scold their children when their children do not pay attention towards their studies. 35% parents feel angry and bad, 30% parents try to motivate them, 15% parents never get angry with their children whereas 20% parents think that it is necessary to be in competition when their wards gets less marks.

Interpretation of questions of teachers' interviews : 20% teachers think that 25% to 30% students feel nervousness during exam, 5% teachers believe that it depends upon subjects; 10% teachers believe that 50% to 55% students feel nervousness. According to the teachers' observation, 40% students pay attention towards study, 40% students participate in all the activities, 10% students feel study as burden whereas 10% students feel tension during their study. According to the teachers' observation, 25% weak students of 11th and

12th feel nervousness during the year, 15% weak students disturb the class, 10% weak students remain aloof and feel study as burden, 25% weak students try to seek the help from others, 10% weak students try to learn with patience whereas 15% students feel shy during the year. According to the teachers' observation, 15% students suffer from fever and loss of appetite, 15% students suffer from headache, 15% students suffer from different problem due to the change in the atmosphere, 20% students suffer from different diseases due to unhealthy food, 15% students suffer from different diseases due irregular food whereas 20% students suffer from different diseases due to the adolescence age. 10% students do not study seriously, 15% students feel depression due to the bad company of friends, 15% students get excited or burst into tears when they are in depression, 20% students remain reserved and fear ridden during depression, 05% students feel depression due to their social background, 20% students feel depression due to competition among students, 15% students feel depression due to too much stress about study and homework. Thus, this portion focused on the analysis and interpretation of the data collected through interviews and survey. This is followed by Findings, Suggestions for further study and Implications.

Findings : Most of the students have difficulties in coping with the studies and homework but they can manage their time to relax and enjoy satisfactorily and get time to play with their friends and watch movies once in a month. Very few students feel hunger and headache during the time of examination. Most of the students study due to their interest and are not ready to leave their studies. Very few students want to study due to their teachers' and parents' pressure. Most of the students get enough time for studies. Most of the students' teachers and parents want them to study harder and are dissatisfied with the performance of the students. Most of the students feel bad and jealous when their friends score more marks. Most of the students think that their parents should motivate them. Very few students think that studying makes them tense. Some of the students think that their parents get unnecessarily angry with them. Very few students think that their parents and teachers should not scold them about studies. Some of the students have fixed goals in their life. Some of the students feel that they should perform like their friends in exams. Very few students like only to study.

Implications of the Study : After this study the researchers arrived at following conclusion that most of the students feel stress in their studies but they are able to manage their time, to relax, to play with their friends, to watch movies. Most of them have fixed goals in life. They want to perform as well as their friends. Their parents and teachers want them to study more. They also feel that their parents and teachers are unnecessarily angry with them. Parents and teachers should motivate them more. Many of them are not satisfied with their performance and feel tensed during exam. The Gujarati medium students are better in managing time. The Gujarati medium students feel less stress in the comparison of the English medium students. English medium students feel more headache than Gujarati medium students. Parents and teachers feel that students should study more. They feel dissatisfied with their performance. It may cause stress among them. As Gujarati medium students feel less stress than English medium schools, it suggests that students feel more comfortable in their mother tongue. Parents and teachers have major role to play in motivating and encouraging the students. They should not scold and causes stress for the children but provide proper counselling to de-stress their children.

Conclusion : In this way, the study can go a long way to help teachers, parents and even students to help them know about stress at the higher secondary level. The study can help in diagnosis of the students' problems and the possible remediation. It is rightly said that future of a country is seen in the classrooms. If students are satisfied, happy and without tension then the country will develop. If our students are tensed, nervous and disturbed, the future of the country will also be disturbed. So it is necessary for parents, teachers, leaders and counsellors to work in this direction i.e. to provide suitable and conducive environment for all-round development of children. Too much nervous, exam oriented children face difficulty in life. The research experience has certainly helped the researchers to develop insights not only into students' behaviour but also some ways of helping them to cope with stress.

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EFFECT OF LEARNING STYLES ON LEARNING ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS

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Abstract

The objectives of the study were to investigate the relationship between different learning styles and learning achievements of students studying at secondary schools. To investigate the relationship two types of data were collected. Firstly information about students learning styles were collected by using learning style questionnaire, secondly information about students' achievement was taken from the test conducted. The population of the study was students studying in class 9th of 10 different School of Ahmedabad. The sample (1580 students) was drawn by using multistage sampling technique. The data were collected by administering the questionnaires to students in their classes. It was found Students did not preferred collaborative and dependent learning style. They preferred to study at their own this leads that the class room activities were of no use for them. Their concern for the achievement showed their interest for examination. This showed that learning styles may not effect learning achievement but the system of examination effects the achievement. In the light of conclusions it was recommended that the system of examination may be connected with class room activities. It may focus on real classroom learning not to rote memorization.

Key words : Learning Styles, Learning Achievement, Secondary School

Life from its start to end is learning. Learning continues since the start to the end of life. The concept of learning is as old as development. The aim of education is the development of six aspects of the personality. These six aspects of personality development are physical, mental, social, spiritual, esthetic and emotional. Development is associated with achievement so the ultimate goal of learning is achievement. According to Dictionary of Education (2002, p.5) achievement is "successful accomplishment or performance in particular subject or course or area of study". Many educationist and psychologists tried since long to know the ways and means of learning and to maximize the achievement. These ways of learning were identified as learning styles and means of learning were the opportunities provided by the environment either by school or by parent. to maximize learning the efforts of all the concerned persons were remained continued as the life goes on. The contributions of psychologist were remarkable for understanding the process of learning. Their contributions were started from Behaviorists to Humanists and then to Cognitivists; all of them described the learning theories. Everyone was trying to define the concept of learning, the nature of learning, How learning takes place? How individual learns? Which factors influence the learning process? Which 2 factors effects academic achievement? What physical and mental changes came as the result of learning? Which steps should be followed to be a learned person? Every psychologist perceives the process of learning in a different way. Those different ways of learning were called learning theories. The learning theories gave new and diverse directions to study the process of learning without discarding the previous.

Relationship between Learning Styles and Learning Achievement : Many students failed to explain everyday phenomena by using concepts they have learned during their educational training. This is not due to the lack of knowledge, because all the students attend 180-200 school days interacting with lectures and practical activities and they are also evaluated on what they have been taught and what they have learned. The problem is not just the lack of ability to transfer domain specific knowledge into everyday life. Evidence shows that the individuals acquired knowledge is fragmented and is unreliable. Many students do not tried to concentrate on acquired

knowledge so they are unable to understand the basic concepts from the very beginning of their studies. Research shows that students' constructions of a concept sometime differ from that one the teacher holds and tried to present. Different kinds of misconceptions can be identified when students are asked to explain their own views of established concepts. When explored the students' cognitive structure these misconceptions interfere with subsequent conceptual learning. But this lack of conceptual understanding does not interfere with the students' ability to perform well in problem solving situation.

The discussion may be concluded in this way that all the students in a class did not possess and follow the same way of learning. This forced to acknowledge that different students preferred different learning styles. These different learning styles effect their learning achievement. Verma and Sharma (1987) conducted a study on "academic achievement in relation to learning styles of adolescents" The major findings were the group of students have participant learning style has better performance in the total area of the study than the group having avoidant learning style. Another study conducted by Dunn (1989) on "Grouping students for instruction: effect of learning style on achievement and attitude". The results revealed that the learning style has positive effect on the achievement and attitude as the students preferred learning alone performed significantly better in the learning alone condition and the students preferred learning with peers performed significantly better in the learning with peer condition. Learning is the most important component in education system. Learning style is an individual's characteristic way of responding to certain actions in the instructional environment which leads to learning. The learning styles may have different effects on the student's academic achievements. The study was designed to explore the effects of student's learning on learning achievement at secondary school level.

Research Design and Method : The research design used was descriptive and the nature of the study was ex-post facto research. The independent variables were learning styles of the students and the dependent variable was learning achievement of sampled students.

Instruments : For the research two types of data were required: first; information about students Learning Styles, sec-

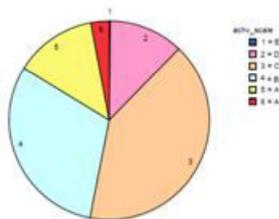
ond student's achievement scores. For learning styles, Grasha & Riechmann's (1975) questionnaire "Learning Style Scale Questionnaire" was adopted. For the academic achievement test result scores was used.

Results : Table 1 Distribution of students by grades included in the study

Grade	No. of students in sample	Percentage
A+	033	02
A	167	11
B	444	28
C	694	44
D	238	15
E	004	00
N	1580	100

Table 4-1 gives the detail of sampled students' academic achievements according to their respective grades. It shows that only 13% students were declared as pass in A and above grade, 28% students were in B grade and 44% were declared as C grade achievers and only 15% were low achievers. It is further be clarified by Pie graph. The graphical representation of students' achievements by grades is presented by Pie-graph as follows:

The graphical representation of students' achievements by grades is presented by Pie-graph as follows.



Graph-1

Showing achievement of respondents by grades

Graph-2 highlights number of respondents in different grades. The part number 6 of pie graph represents number of respondents who achieved A+ grade. The part 5 showed respondents in A grade. Part 4 was showing B grade achievers, similarly part 3, 2 and 1 represents number of students in C, D and E grades respectively. E grade achievers were reflected by 1 they were small in number (only 4) so it was not visible by graph. The greater part of the graph is showing the total number of C grade achievers. This indicates that the performance of majority was below average.

Table - 2

Achv	Scale
1	E
2	D
3	C
4	B
5	A
6	A+

The overall relationship between learning styles and students achievement is presented in the following table.

Table 4-3

Relationship among different Learning styles and Pearson value of students' achievements by grades

Learning styles	A+	A	B	C	D	E
Independent style	022	089	048	041	027	367
Dependent style	086	155	007	040	053	494
Collaborative style	388	082	066	023	042	Not Defined
Competitive style	Not Defined					
Participant style	166	014	070	033	005	494
Avoidant style	046	036	036	049	002	494
Significant at $\alpha=05$						
Total number of respondents = 1580						

Table 3 depicts that only two relationships were negatively significant. Those were between the A+ and A grade achievers and collaborative and dependent learning styles respectively. The other students having B, C, D and E grades have no significant relationship with any learning style. Further the results of the table showed that the highest value of $r = 494$ was of "E" grade achievers and dependant, participant and avoidant learning styles. "E" grade achievers have no preference for dependent, participant and avoidant learning style. A+ and A grade achievers were studying independently without co-operating with others. These results indicate the preference of high achievers and low achievers. A+ grade achievers and E grade achievers both were not dependent. The reason of both may be different. One group (A+ grade achievers) was more concerned about their studies but other seems

having less concern for studies. Both prefer the same style. Both are studying in same class. This shows classroom environment did not effect both groups' achievements or both groups have no interest for classroom activities. Both want to study out of classroom environment.

Findings based on the analysis of relationship between learning styles and achievement

This section presents the findings about the relationship of learning styles and learning achievement. The main findings were: The high achievers (A+ and A grade achievers) do not prefer collaborative and dependent learning style. There is a significantly negative relationship between collaborative and dependent learning styles and high achievers. Some relations although not significant yet exist among A+, B, C, D and E grade achievers and learning styles. There is a positive relation



between A+ grade achievers and independent learning style. There is a positive relation between B grade achievers and participant learning style. There is a positive relation between C grade achievement and avoidant learning style. There is a negative relation between D grade achievement and dependent and collaborative learning style.

Conclusions : The conclusions drawn from the findings of the study are as follows: The A+ , A and D grade achievers do not prefer collaborative and dependent learning styles. B grade achievers prefer participant learning style. C grade achievers prefer avoidant learning style.

Recommendations : The following recommendations were made in the light of findings and conclusion of the study: The high and low achievers have no interest for classroom activities as they do not prefer collaborative and dependent learning style. The average ability student's preferred independent learning style, means they like out of class learning. All the groups have no interest with classroom activities. This is an alarming situation for Educationists. There is a need to bring the students back in to the classroom. This may be possible only when the students feel that the classroom activities are interesting and beneficial for their studies. This can be made by making teaching and learning attractive for the student. It is therefore recommended that the teaching may be made student-centered. The practical activities are recommended rather than the theoretical explanation of concepts. This can be done in two phases: one by motivating working teaching staff during refresher courses, second by renovating the activities of prospective teachers at professional training institutions. The prospective teachers may be trained for this situation during their professional training courses. The research institutions and professional training institution can tackle this situation in such a way by shifting the curriculum of prospective teachers to activity based methodology from the theoretical perspective. It is easy to train new teachers rather than changing the old one. If this situation will not be taken by responsible persons the students will lose motivation and the country will face a big problem. The classroom teaching can be made effective by linking it with internal assessment system. The internal assessment provides a link between the teachers teaching and students learning. This provides a binding force to students and teacher's and binds them together to improve the teaching learning situation. The findings of the research showed teachers were teaching in an alien environment and students were focusing the examination style no link exists between them every one going on their own way. There was no activity to bridge their teaching and learning. Both were working in different directions and this is not a healthy situation. It is therefore recommended that internal assessment may be given weight-age along with the final evaluation. It is further recommended that classroom-based assessment program may be launched at schools. Classroom-based assessment is used to make decisions to improve instructions for learning. It is designed to assist students learn-

ing. This assessment is subjective, informal, immediate and ongoing and is based on students' performance in the situation where students actually demonstrate proficiently. But the teachers' practices regarding class assessment may be flawed with poorly focused questions, predominance of questions that require short answers, repetition than reflection and they may be influenced by the requirements of external examination. For the improvement and development of teachers' competencies regarding assessment techniques and its uses some activities are suggested at cluster schools; after each terminal examination. In such activities teachers can highlight the practices used by them for the assessment of students and its advantages. They may also discuss which were difficult to use and how to remove these difficulties. It is recommended that the pattern of examination may be shifted from rote memorization to skill acquirement. The public and private partnership can be welcomed to design and construct teaching learning material for students and teachers and its availability at learning institutions so that institution may provide the learning experience to the students.

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COMMUNITY PARTICIPATION IN TOURISM DEVELOPMENT WITH SPECIAL REFERENCE TO MANIPUR

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Abstract

Community based tourism is tourism in which local residents (often rural, poor and economically marginalized) invite tourists to visit their communities with the provision of overnight accommodation. The residents earn income as land managers, entrepreneurs, service and produce providers, and employees. At least part of the tourist income is set aside for projects which provide benefits to the community as a whole. When we come to 'Community participation' it refers to a form of voluntary action in which individuals take up the responsibilities of citizenship. Community participation is an educational and empowering process. People cooperate with those able to assist them, and identify problems and needs for mutual concerns. The term 'community' or 'host community', in the context of tourism, refers to a group of people living in the same locality, or tourism destination. In the Northeast Region (NER) of India in general and Manipur in particular the concept of community participation in tourism development is not widely prevalent and is in infancy stage. In this backdrop the paper adopt a hypothesis that Community based tourism is a factor for maximizing the socio-economic benefit of the community and growth of tourism industry in the state. It also looks into the aspect of how different communities in Manipur can participate in tourism development.

Key words : Community participation, Community based tourism, host community

Situated strategically on the extreme Northeastern frontier of India bordering Burma (Myanmar), Manipur has been through the ages the meeting ground of the people and civilizations from the east and the west, a sort of melting pot of the Indo-Aryan and Mongoloid races and their cultures. In the ancient period, Manipur experienced waves after waves of traders, invaders and colonizers because of its strategic location. Being located on the international route by which people from the Indian sub continent could reach the ASEAN countries. The state of Manipur comprise of 9 districts. They are Bishnupur, Chandel, Churachandpur, Imphal-West, Imphal-East, Senapati, Tamenglong, Thoubal and Ukhrul. With total population of 23,88,634 (census 2001) and 22,327 sq. km. in area the State is divided into two distinct spaces. In the centre there is a valley of 2,238 sq. km. (10 per cent of the total) surrounded by hills stretching from the northern to the southern direction. The hills constitute 20,089 sq. km. (90 % of the total). The valley is inhabited mostly by the Meitei and in the hills by the Naga and Kuki tribes. In many literatures- colonial ethnography, local history and travelogues, this tiny state is describe as a land of green valleys, blue hills and a mosaic of a rich cultural heritage. This means that in both the valley and hill areas there are important tourist centre and historical sites which we cannot mentioned all in this paper. Among the abundant endowments, nature has gifted Manipur, the brow-antlered deer- Sangai, the Siroy Lily and the Dzuko Lily are sui generis- which are not available anywhere else in the world. All these are only waiting for the tourists to come and be seen. The potentiality of tourism that could be developed as the most profitable industry in the state is higher than that of any other normal industry. Another aspect is that in every historical sites and tourist centre we found a history of ethnic relations- the story of emotional relationship between the three ethnic communities i.e. the Meitei, Kuki and Naga. But unfortunately due to the politics of ethnicity in the modern world the underlying history of the sites were forgotten. In a nutshell its significance has almost lost. We found very less domestic tourist and the infrastructures surrounding it were in shambles. No social interaction and no gathering. As a result the chasm between the ethnic communities increases day by day. However in our in depth study and interaction with local communities we found the prospect of tourism are still in plenty.

The local communities respond that due to political problem social interaction among the communities is widening. But the feeling of oneness in their mind still prevails. The hospitality and tolerance that make essential fabrics of the Manipuri society have not lost. Manipuri people don't have the nature to ill-treat their guests and make them victims of circumstances the like of which we had seen in Jammu and Kashmir. In this situation community based tourism will play a vital role in bringing the growth of tourism industry as well as bringing communal harmony in the state. People know that through tourism a community can earn income of their own, but the real concept of community participation in tourism development is not aware among the people of the state. In order to implement this system we need to impart education on tourism development. Therefore in this regard the role of state authority that is Tourism Department is very important. In recent past we have seen tourism festivals known as 'Sangai festivals' in Manipur being organized every year but lack the participation of communities from deferent part of the state. Similarly, in our study of other NER we hardly found community participating in tourism development. As a reason of this we used NER and Manipur synonymously in this paper. However such practice has started gradually in the state of Nagaland and Sikkim and it is known as 'village tourism'. For instance, in Sikkim, the idea of village tourism is that every villager should construct two extra rooms to accommodate tourists. The tourists, in their turn, can have the taste of rich cultural tradition that the state offers. This will also economically benefit the average Sikkimese, especially the rural population. In general most of the Northeastern states severely lacks the wherewithal for building up infrastructure and creating a pool of well-trained personnel. Most of the investment and technical assistance essential for the development of tourism in the developing countries come from outside sources - multinational firms, foreign governments, and international financial institutions. The tourism industry is controlled either directly through their local elite agents for the benefit of outsiders. There has been no participation by and consultation of the local people in decision-making. Tourists have minimum contact with the local people and the locals do not share the wealth and income tourism generates. Tourism is isolated from the local economy; obviating any

linkage tourism may have with other sectors. The locals are thus alienated from the development and benefits of tourism. There are well-documented evidences of local people having only a little or no say in the development of tourism in their locality.

Concepts of 'Community Participation' in Tourism Development : Collective action includes planning, management, and control of local resources for the solution of the common problems and materialization of common needs. In this sense community participation involves a shift of power from the ruling elitist decision-making group to the common man who had been traditionally kept out of the power ambit. Thus, community participation may be regarded as a tool to readjust the balance of power. It exemplifies the reassertion of the community views against the idea of centralized decision-making as the developer of local communities. Participatory experience of the people in the process of development has become the inspiration for community participation in tourism development process. Community participation in tourism development process can thus be construed as an offshoot of community participation in the development process. This concept is supported by the views of many scholars in the following way. Inskeep¹ has pointed out that host communities must have a voice in shaping their future as a matter of right. He has called for the maximum involvement of the local community to maximize socio-economic benefits of tourism for the community. Woodlet² has argued that "a community based approach to tourism development is a prerequisite to sustainability". Ryan and Montgomery³ have stressed that "communities need only be educated about the benefits of tourism, and that their involvement in good visitor management techniques will actually solve problems". A contented host community is the strongest base for a thriving tourism industry. If that condition is obtained, the facilities built up by the tourism industry will be beneficial both for the host and the guest. Further believe that community participation is a tool to solve major problems of developing countries: achieving a more equitable distribution of benefits of tourism and discouraging undemocratic decision-making. Thus from the above concept and definition we can infer that the most basic requirement for the development of tourism is the tolerance of residents at destinations towards tourists. Community participation alone can create a favourable attitudinal change among the locals towards tourists at the destinations. Resident-tolerance will come spontaneously and gradually acquire strength if opportunities are provided from the very start for active participation of the local people in the ownership and operation of tourist facilities. This inevitably calls for conscious and meticulous planning of tourism. Here again Murphy⁴ has emphasized a planning strategy that focuses on identifying the host community's goals and desires for and capacity to absorb tourists. He stresses that each community must have the freedom to identify its own goals and pursue tourism to the extent that it satisfies local needs. This style of planning recognizes that social and environmental considerations need be included in planning and that tourism should serve both tourists and local residents. If local people are not involved in the process, the implementation of even the most well-planned and well-meaning programs will be altered by those very people. Furthermore, tourism is a complex domain where the solution of issues hinges on the interplay of various stakeholders such as the public sector, private sector and organizations, and environmental activists. No single individual or group can, by acting alone, resolve tourism prob-

lems. Hence planning of community-based tourism development must recognize and include the interests and views of the various stakeholders involved in decision-making. However despite the above theoretical insights certain limitation of community participation in tourism development can be analyzed. The limitations may be analyzed under three headings: Limitations at the operational level, Structural limitations, and Cultural limitations.

Limitations at the operational level : This limitation level include the excess of centralization of public administration of tourism development, lack of coordination between parties involved, and lack of information made available to the local people of tourist destination.

Structural limitations : This type is found in many developing countries where community participation seems to be problematic due to structural constraints associated with institutional power structures, and legislative and economic systems.

Cultural limitations : There are some cultural factors that function as obstacles to the emergence and application of participatory tourism development approach: limited capacity of the poor locals, and apathy and level of awareness in the local community. The above mentioned limitations also have its roots in the NER in general and Manipur in particular because of the ethnic plurality in the region. Despite such constraints we can draw the following points which may function as policy implications for participatory tourism development approach in NER: Opportunities for local people to take part in decision-making process, Decentralization of the administrative system, Avoid the system of clientelism. Engage local social organizations/institutions/NGOs in tourism development, Respect the cultural attitudes of local communities

Create opportunities for the local people to take part in decision-making process : We can look community involvement in tourism from two perspectives- in the decision-making process and in the benefits of tourism development. Community participation in tourism development in many of the Northeastern states has been contemplated as a means of conferring economic benefits through the creation of employment or through the opening up of small-scale business ventures. It has seldom been recognized as creating opportunities for local people to have a voice in the decision-making process in tourism development. The face of the matter is that without the local people having a say in the decision-making process, it is very difficult for them to get adequate benefits from tourism development. Thus the opportunity for taking part in the decision-making process is a precondition for sharing economic benefits. It is also pointed out that as tourism becomes very popular, outside capital flows on a large scale into the destination, alienating and ultimately proletarianising the locals. It is therefore imperative that measures must be taken in the initial stage itself for empowering the local people to keep control over tourism development.

Decentralization of the administrative system : The administrative system and planning activities in NER are highly centralized with little or no space for democratic citizen participation. Obviously, community participation requires decentralization of public administration. However, for participation to be meaningful, decentralization must be accompanied by a conscious and deliberate action for granting autonomy to local bodies. Local autonomy enables communities to bring to light the possibilities of exercising choice and thereby acquire the capability in handling their own development. Hence, local governments should be reorganized

to defend, protect, and reflect concerns and interests of local people in their administrative territories. Additional financial resources should be made available to the local authorities for initiating and operating community development projects and organizing participatory activities. In other words, there must be an explicit and adequate financial commitment to community involvement in tourism development. Care must be taken to see that the reorganization and empowerment of local governments do not lead to a transfer of power to the traditional local elites, the self-willed local barons. For such transfers will only worsen the conditions of the weaker and disadvantaged sections of the local population. Hence new measures must be designed and implemented to ensure equal treatment of all residents. The decentralized public administration structure should also incorporate special education and training programs to enable the locals to become involved in the tourism development process as entrepreneurs and employees. As part of this educational and training programs free consultancy services should be made available to tourism-related and other small business in tourist destinations. Moreover, tourism development workers should be hired to work with the locals to develop and market value-added

Avoid the system of clientelism : At present the socio-political, cultural and economic structures of NER have over-politicized the state, which has ushered in a patron-client relationship between politicians and elite business interests. The politicians at the helm of affairs have access to immense state resources which they hand out to their elite business clients at the expense of the majority. This system is called a clientelistic approach to development. If this system is prevalent the locals will be isolated from the affairs of tourism development. The only way to do away with clientelism is to establish a strong democratic state. The democratic state ultimately works against clientelism and makes it easier to utilize financial, fiscal, and educational instruments to enable people to involve in tourism development.

Engage local social organizations/ institutions/ NGOs in tourism development : The local social organizations may not always remain mute to their systematic alienation from tourism development. They may at times react, especially about the manner in which the benefits of tourism development are distributed. The dominant groups may view such reactions as revolutionary ideological movements which may threaten the very existence of the tourism industry. This possibility of misunderstanding may inflict a sense of despondency and fear in the community leaders and the communities themselves. This results in frustration which holds back the locals from expressing their opinions on matters relating to tourism development. Here external agencies such as the NGOs and civil societies can play a critical role because they are closer to the people and therefore understand them better. They are good institutional tools to empower host communities. They can effectively use the various educational, organizational, financial, socio-cultural, psychological, and political means to move towards a more participatory tourism development approach. According to Desai, the NGOs have two functions in this context- service delivery and policy advocacy. Service delivery means to provide technical, legal, educational, and training services to the host communities for involving in the tourism development process. Policy advocacy means lobby-

ing directly for policy changes. Usually the government channels incentives through institutions such as the municipalities, banks, and technical training schools. NGOs can assist communities to access these institutions and thus enjoy the various fiscal and financial incentives provided by the government for tourism. NGOs can also extend additional financial assistance, which will enable the local people to have a greater stake and influence in the development of tourism in their locality.

Respect the cultural attitudes of the host communities : Community involvement in local affairs, including tourism, is not uncommon among traditional communities. There are communities in which the provision for public involvement is engraved in their cultural mores. In this aspect we can look into the case of Solomon Islands by Sofield⁵. He provides us that the Island culture requires consultation with communities before embarking on any venture hitherto unknown to the locals. Any default on this count, the community will consider as an affront to its rights, and may lead to violent conflicts. The Solomon Islands episode underlines the necessity of prior knowledge and respect for the cultural attitudes of the host communities, if investors that is, non-local, in tourism development in the NER are to succeed. However, participatory culture is not a feature common to all communities. Cultural remoteness of communities to tourism is, in fact, a limitation to local participation in most of the northeastern states of India. The removal of cultural barriers to participatory tourism development is not a easy development effort; it requires a long educational process. Flexibility is an essential ingredient of any form of participatory tourism development approach.

Conclusion : Thus we viewed that the priority and most critical factor for ensuring community participation in Tourism is the involvement of host communities in the decision making process. A greater involvement of the community facilitates the success of planning at the destination level to make it a path for domestic and in turn for international Tourism. The key stakeholders in the Tourism Development process must bear this critical factor in mind while taking each and every initiative towards the development activities at the destinations. The three rationales- the planners, the administrators and the agencies of Tourism development in the NER should pay attention to provide adequate space for the content of the community responses and their perspectives that, in turn, pave the way for the successful implementation of Tourism programs at destinations.

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EFFECT OF YOGA PERSONALITY DEVELOPMENT CAMP ON THE TRIGUNA IN CHILDREN

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Abstract

The study comprised to comprehend the effect of Yoga Personality Development Camp on the trigunas in children. The study was pre-post design with control group. 200 children (100 children in each group), aged 8-12 yrs, selected from a residential camp at Prashanti kutiram Jigani (Yoga group) and Jayagopal Garodia Rasrtothana school. Experimental group children practiced Integral Yoga module including Asanas, pranayama, nadanusandhana, chanting, and games. Control group children were under daily routine. Sushruta Child personality inventory was administered before and after 10 days. Mann-Whitney U test and Wilcoxon Signed Ranks Test were applied. Sattva increased significantly, while Rajas and Tamas decreased significantly as compared to the control group. Yoga Personality Development camp has the significant effect on Sattva, Rajas and Tamas in Children.

Key words : Yoga, Sattva, Rajas and Tamas

Indian philosophy conceptualizes Trigunas (Sattva, Rajas, Tamas-representing knowledge, activity, inertia) are the source of the personality. Âyurveda classics point up sixteen types of mental constitution (7 Sattva, 6 Rajas, 3 Tamas) formed at the time of conception¹⁻³. Accordingly, they assert Rajas and Tamas are responsible for psychological disorders. The association between Âyurveda concept and modern gestalt theory and the correspondence of 16 types of personalities with 16 types of psychological disorders has been discussed⁴.

Stress has reduced through Mindfulness training in school age children⁶. Kripalu yoga training has shown preventive benefits in psychosocial well being when compared to physical exercises⁷. Studies regarding exercise effects on overweight, growth, chronic illness, depression and anxiety in children and adolescents are reviewed⁸. Slow and fast suryanamaskara are compared in children⁹. Efficacy of a movement based, modified RR program, involving yoga and dance in treating behavioral and some core features of autism has been examined¹⁰. An executive function in children has been improved by yoga¹¹. Attention in children has been improved as an immediate effect of yoga relaxation techniques¹². Imitation skills in children with autism spectrum have been increased by integrated yoga therapy¹³. Randomized controlled studies which investigated the efficacy of mediation therapy in children and adults diagnosed with ADHD have been discussed¹⁴. Individualized yoga therapy has been proven as adjunctive therapy for eating disorders in children¹⁵. Effect of breathing exercises on respiratory parameters in children has been studied¹⁶. Six month yoga training has improved muscle power, dexterity and visual perception in girls¹⁷. Pranayama effects on grip strength and spatial memory have been reported¹⁸. Visual and spatial memory has been increased by GES educational program, based around integrated yoga modules¹⁹. Relaxation and yoga exercise have reduced anxiety of children and adolescent group²⁰. The efficacy of integral yoga module as an effective therapeutic tool in the management of mentally retarded children has been proven²¹. Higher scores in life satisfaction and lower scores in excitability, aggressiveness, openness, emotionality and somatic complaints was followed by hatha-yoga practice²². A study has reported significant changes in Sattva, Rajas, Tamas by integral yoga practice on subjects of age group 17-63²³. A randomized controlled study has shown the influ-

ence of Yoga on Gunas and self esteem in comparison to physical exercise²⁴. Another study has reported changes in well being of children after yoga²⁵.

As there was no study available on the effect of Yoga Personality Development Camp on trigunas in children, requirement was felt for the present study to be carried out.

Methods : Study was approved by ethical committee of SVYASA. This study has pre-post design with control group. Yoga group children attended ten days Yoga Personality Development Camp. Sushruta child personality inventory (In peer review) was administered at the beginning, and at the end of ten days. Sattva, Rajas, Tamas mean scores were analyzed. SPSS (16.0) was used for the statistical analysis. Kolmogorov-Smirnov test was applied to check normal distribution of the data. Within group significance was analyzed by using Wilcoxon Signed Ranks Test and between group significance was analyzed by Mann-Whitney U test. Sushruta child personality inventory which was based on Sanskrit verses quoted in nine texts and content validity by Ayurveda experts and psychologist. It had three subscales- Sattva (A), Rajas (B), Tamas (C) with 20, 18 and 16 items respectively. It was associated with good reliability (Cronbach's alpha for A, B and C scales were 0.60, 0.64 and 0.61 respectively and split half scores were 0.62, 0.68 and 0.54 respectively. Factor validity coefficient Scores on each items was above 0.3. 100 children (for each group) of the age group 8-12 years from Yoga Personality Development Camp in Prashanti kutiram and Jayagopal Garodia Rastrotthana School Bangalore were included in the study. Children with Attention Deficit Hyperactive Disorder, Autism, Psychosis, who are mentally challenged were excluded from the study. In Yoga group 46 boys and 54 girls were there. Similarly in control group 52 boys and 48 girls were there. (Table-1) Yoga practices included Breathing exercises like ankle stretch breathing, hand-stretch breathing, Dog breathing, Rabbit breathing, Dynamic exercises like jogging, forward-backward bending, Surya-namaskara. Asanas like vrkshasana, veerabhadrasana, ustrasana, padahasthasana, ostrich pose, blossom. Pavanamuktasana kriya, Pranayama like- nadishuddhi, bhramari, Yogic breathing, Nadanusandhana. Yogic games like search engine, find the leader. Along with that stories. Vedic chanting, Bhagavad-Gita chanting.

Table-1 : Demographic data

Sample	Yoga	Control
Gender	46 boys/N-160	52 boys/N-160
Age	8-12 years	8-12 years
Mean± SD	10.91±1.07	10.01± 1.24

Table 1 gives demographics of both groups. In Yoga group 46 boys and 54 girls were there. Similarly in control group 52 boys and 48 girls were there.

Results : Yoga group showed significant changes in Sattva, Rajas and Tamas after intervention. Although in control group there was no significant changes. (Table-2)

Table-2 : Mean scores of both group and significance

Guna	Y(pre)	Y(post)	significance	C (pre)	C(post)	Significance
Sattva	9.40±2.80	10.81±2.77	.001*	10.26±2.77	10.08±2.90	.003*
Rajas	8.16±2.49	7.54±2.46†	.001*	7.52±2.36	7.62±2.32	.086
Tamas	9.95±2.06	8.84±1.92†	.001*	9.65±2.39	9.72±2.42	.144

Table 2 gives mean scores and standard deviation of yoga (Y) and control (C) group before and after ten days of intervention. Sattva has increased and Rajas and Tamas have decreased significantly in Yoga group compared to control group. (*Wilcoxon Signed Ranks Test). Post intervention changes in Rajas and Tamas was significant, showing both groups are different.

Table-3 : Mean scores of Boys and Girls (Yoga group)

Guna	B(pre)	B(post)	significance	G (pre)	G(post)	Significance
Sattva	9.56±2.79	10.80±2.95	.001*	9.25±2.82	10.57±2.62	.001*
Rajas	7.95± 2.47	7.35±2.55†	.001*	8.33±2.52	7.68±2.33	.001*
Tamas	9.86±2.10	9.08±1.84†	.001*	10.01±2.10	8.90±1.99	.001*

Table 3 gives mean scores and standard deviation of Boys and Girls in Yoga group before and after ten days of intervention. Sattva has increased and have increased. Rajas and Tamas decreased have significantly in both Boys and Girls. *Wilcoxon Signed Ranks Test). But changes in Girls in all gunas are more compared to the Boys.

Post intervention changes in was not significant between groups, showing both groups are not different for the effect of Yoga.

Table-4 : Mean scores of Boys and Girls (Control group)

Guna	B(pre)	B(post)	significance	G (pre)	G(post)	Significance
Sattva	10.55± 2.65	10.32±2.77	.005	9.93±2.89	9.81±3.04	.157
Rajas	7.26± 2.18	7.40±2.11	.108	7.79±2.54	7.85±2.52	.439
Tamas	9.59±2.43	9.65±2.49	.366	9.70±2.36	9.79±2.36	.248

Table 4 gives mean scores and standard deviation of Boys and Girls in control group before and after ten days of intervention. Rajas and Tamas have increased. Sattva has decreased in both Boys and Girls, but changes were not significant.. *Wilcoxon Signed Ranks Test). Post intervention changes in Sattva,Rajas and Tamas was not significant between groups, showing both groups are not different after intervention.

Table-5 : Significance values between Yoga and Control Boys and girls

Guna	boys(pre)	boys(post)	girls(pre)	girls(post)
Sattva	0.060	0.266	0.231	0.273
Rajas	0.186	0.054	0.207	0.254
Tamas	0.477	0.001	0.593	0.001

Table 5 gives significance values of both Boys and Girls between group analysis of Yoga group with control group . Post intervention changes in Tamas ,after Yoga in was significant in both boys and girls showing both (Yoga and Control) group are different.

Discussion : Present study has described the effect of ten days, Yoga personality Development Camp on trigunas in children. Scores on three subscales before and after were not distributed normally. (Kolomogorov-Smirnov Test). Baseline data in two groups were not significant. Scores on Sattva scale were increased significantly after yoga practice. Similarly scores on Rajas and Tama scale were decreased significantly. While in control group Rajas and Tamas has increased (table-2) though not significant. Changes after yoga in yoga group were significant (Wilcoxon Signed Ranks Test). In Yoga group, percentage of change in Sattva was 12%, Rajas was 7% and in Tamas was 11%. However, in control group it was 0.2%, 0. 1% and 0.07% respectively. Earlier studies have revealed Sattva score changes (increased) were ²³ and changes in Rajas scores (decreased) were not significant.²⁴ Percentage changes in earlier study were 6% (Sattva) , 9% (Rajas), and 6% (Tamas)²⁴ and it was 5%, 2.5% and 3.3% respectively in the other study done on adults²⁵. While the present study has exhibited significant changes in all Sattva, Rajas and Tamas. (Table-6)

Table -6
Comparison of results with other studies

Studies	Age range	Sattva change	Rajas change	Tamas change
Present Study	8-12 years	12%	7%	11%
Khemkha et al study ²³	17-63 years	6%	9%	6%
Sudheer Deshpande et al study ²⁴	18-71 years	5%	2.5%	3.3%

Results of comparing scores on Rajas and Tamas after experiment showed two groups are significantly different in changes occurred. (Mann-Whitney U-test), though Sattva change was not significant. Sattva, Rajas and Tamas scores were analyzed for Boys and Girls in both groups. This showed Yoga has significant (Wilcoxon Signed Ranks Test) effect on Rajas and Tamas in both Boys and Girls compared to control group while girls showed more change compared to boys. (Table 3 and 4). Between group analysis of boys in both groups and girls in both groups revealed changes in Tamas was significant (Mann-Whitney U-test) in both boys and girls. (Table-5) Meditation practiced by children in this study helped to increase Sattva guna. Ayurveda describes Self-knowledge (Ātmajñāna) enhances Sattvaguna. Earlier research work³⁰ has discussed Kapha correlates with Sattvaguna. Earlier studies have shown Sattva guna increases after yoga^{26,27}. Energy consumption results by Yoga and that results in increase in Kapha. This investigation has proved the increase in Sattva by Yoga. Dynamic exercises and Āsanās practiced by the children helped in reducing Rajas and Tamas. As energy stored in the mind in the form of thoughts is expended through the physique. Pranayama also helped as it reduces the speed of the mind. The strength of this study it is the first attempt to explore the effect of Yoga Personality Development Camp on trigunas in children. It has compared yoga group with control group. Researcher was blinded for yoga practice. While, Ayurveda quotes, persons with predominance of Rajas and Tamas are prone to psychosis and neurosis. The present result may point, that yoga helps to move towards positive health by increasing Sattva guna. The study has discarded null hypothesis that yoga cannot reduce Rajas and Tamas and increase Sattvaguna. Limitations of the study is though yoga personality camp has resulted in significant changes in trigunas, samples were not randomized. Assessor was not blinded. Future studies are required on randomly assigned sample with blinded assessor. Effect of different types of yoga module, eg. Āsanās, Pranayama, Meditation can be studied independently.

Conclusions : The present study has showed that a ten days practice of integral Yoga has a significant effect on Sattva, Rajas and Tamas in children as compared to control group, of the age group 8-12 years. This may point out towards prevention of psychological disorders.

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PRIVACY CONCERNS IN FACEBOOK SITE

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Abstract

Today social networking sites play an important role and inexpensive way to maintain existing relationships and present oneself. However, the increasing use of online sites give rise to privacy concerns and risks. All Internet sites are also under attack from phishers, fraudsters, and spammers. They aim to steal user information and expose users to unwanted spam. They have so many resources at their disposal. This paper studies the awareness of college students regarding the privacy in Facebook. The authors intended to know how students are concerned about their privacy in Facebook, and the extent to which they use the privacy enhancement enablers. In our study, we present results from a survey of 200 users of Facebook who are studying in college. The results show that most of our respondents, who are active users of Facebook, not disclosing the considerable amount of private information, they are well aware of the visibility of their information to people, they change their privacy setting accordingly and do not accept the strangers friend request. Furthermore, Facebook's updated privacy policy and the terms of use were largely known by our respondents.

Key words : privacy, Social networking sites, Facebook

Now a days almost everyone uses social networking sites. One of the popular site is a Facebook. The internet is an invention that has had a tremendous impact on the world. Facebook was founded in 2004 by Harvard student Mark Zuckerberg and originally called thefacebook. It was quickly successful on campus and expanded beyond Harvard into other Ivy League schools. With the phenomenon growing in popularity, Zuckerberg enlisted two other students, Dustin Moskovitz and Chris Hughes, to assist. Within months, thefacebook became a nationwide college networking website. Zuckerberg and Moskovitz left Harvard to run thefacebook full time shortly after taking the site national. In August of 2005, thefacebook was renamed Facebook, and the domain was purchased for a reported \$200,000 US Dollars (USD). At that time, it was only available to schools, universities, organizations, and companies within English speaking countries, but has since expanded to include anyone. Facebook users create a profile page that shows their friends and networks information about themselves. For interaction and uploading large quantities of personal information people are using Facebook site. Since its origin, Facebook Site have attracted different groups and communities. Technical experts, Businessmen, Social Activists, and Researchers intend to find out the structure of Facebook site, and at the same time take advantage of it. In other way, facebook site is an inseparable part of people's life. The drastic growth in Facebook use has created a privacy concerns. In this paper, author focuses on the concern of the personal privacy that arise between facebook users and how effectively they manage their concerns by expressing preferences for who should be allowed to access posted content. The social networking site, Facebook has been receiving a lot of attention all over the world, particularly because of privacy issues. Facebook is now one of the biggest social networking sites. it is open for everyone who has a valid email address. The success and growth of Facebook has been incredible. The popular social Network Site, Facebook, is the main case study in this paper, that attracts a huge number of users all over the world. Based on a recent report, Facebook has more than 200 million active users. Many research has been done about the different types of information that is posted on Facebook profiles and the privacy settings that users use. The main purpose of this study is to see the awareness of users regarding their privacy setting and protect their information without ignorance or lack of caring while using Facebook site. In this survey, author watched the users profile to find out if

the user changed the amount of information that they provided and to available information to whom. If users change their profile then they are well aware about privacy settings and not providing personal information to everyone. On the other hand, if profiles remained unchanged then it shows that users are not concerned with protecting the information that they give out about themselves. In this survey, the author has considered information disclosed by Facebook users about specific pieces of content that they had posted to their profiles, as well as their levels of comfort sharing content with their friend networks and with strangers. It was observed that most of the respondents denied access to their profile content and friend lists to strangers or people outside their friend network. Respondents who were concerned with privacy settings were not sharing any posts with strangers and significantly blocked the strangers from accessing their profiles. Thus, the results indicate that most of the respondent effectively intensify their concerns over sharing content with strangers. The researcher briefly provide background on Facebook's privacy settings. A Facebook profile is a place where user can manage its information. Some of the users create a Facebook profile with real name and profile picture and some with fake name and profile picture. In addition, users can share various types of data with other users. Such data includes contact information, personal information like gender, birth date, hometown, education and work information, information regarding interest movies, music, clubs, books, relationship status and partner's name, and political orientation. Users can in fact choose to fill in any of this information fields and update their information at any time. Users can communicate by using profile walls or private messages and also share photos and videos with other users. Writing something to others wall is normally visible to either everybody or only friends or to the received user only it depends on the private setting who can see this profile and information in it. Users can also like and comment to the photos, videos or other posted elements. With using "status updates" users can also tell the others what they are doing, where they are, and so on.

Facebook's Privacy Model : At the time of the survey, Facebook site allowed users to manage the privacy settings of uploaded content using five different granularities: Only Me, Specific People, Friends Only, Friends of Friends, and Everyone. Specific People allows users to visible content to only a certain set of people. The default or "recommended" privacy setting for all content is Everyone, Users create a friend list,



add a subset of their friends to it, name it, and can then select the list as a basis for privacy control. Friend lists are private to the user who creates them, unless the user chooses to display them as part of his profile. Each time user make a post or create a photo album, can use lock icon to select who can see that post and album For remaining content types, users can specify different privacy settings for each piece of content

Objectives of the Study : To develop Facebook profile to understand the Use of Facebook's privacy features, and users attitudes towards the strangers friend request and awareness of Facebook privacy in their posted content.

Method : The researcher collected data of students profile information and also collected data on users' attitude towards the strangers friend request and change in privacy setting. The survey as a Facebook application; enabled to pose questions using real profile data and specifically interested in how users manage their profile information, their use of Facebook's privacy features, and users attitudes and awareness of Facebook privacy settings. The data was gathered with a web questionnaire. This method was natural choice because of research subject. The first aim of the questionnaire was to find out background information of respondents and then collect the actual data about users' information disclosing in profiles, users' privacy and security concerns and finally their awareness of privacy on Facebook. 200 Facebook users were invited to answer this questionnaire via Facebook. The questionnaire was available for the college students who are facebook users. The survey asks the user who, ideally, should be able to view and comment on the profile content. For changing privacy settings the user is presented with a number of options, currently allowed by Facebook are *Only Me* - Indicating that the content should be private the user; *Specific people* - The user is asked which of his friends should be able to access the posts. The user can select friends individually from a list ,or can specify users using any friend lists they have created; *All Friends* - Indicating that all of the user's friends should be able to access the posts; *Friends of Friends* - Indicating that all of the user's friends, and all of their friends, should be able to access the posts; and *Everyone* - Indicating that all Facebook users should be able to access the posts. The population was selected from college students who are using Facebook. The survey was conducted on 200 college students who are active user of facebook. The tool of the study comprised to create a facebook profile and to develop questionnaires.

Analysis and interpretation : Out of the 200 facebook user majority of the users 69% say that they only disclose their name and profile picture in their facebook profile, while 31% either they disclose their name only or profile picture only or not both of them.

Table 1

Disclosing real name and profile photo in the facebook profile

Questionnaire item	Yes	%	No	%	n
Are you disclosing both real name and profile photo in facebook profile.	138	69%	62	31%	200

Response-Yes/ No : The majority of respondents 86 % say that they have changed or modified the privacy settings and 14% say that they have not changed the profile setting. The respondents also claim to be aware about the fact that without modifying their privacy settings, their profile will be visible to all the users.

Table 2

Change or Modify the privacy settings

Questionnaire item	Yes	%	No	%	n
Have you changed the privacy settings of the profile.	172	86%	28	14%	200

Response-Yes/ No : Out of the 200 facebook user majority of the users 92% do not accept or reject the friend request from strangers and 8% accept it. It was considered that those who accepted the requests without any investigation or being affected by the gender or picture of the attacker, which presumably is fake will be at risk and become an easy target.

Table 3

Reaction towards the strangers friend request

Questionnaire item	Yes	%	No	%	n
Do you reject the strangers friend request.	184	92%	16	8%	200

Response:Yes/ No : This shows that increasing awareness of privacy will affect the user behavior.

Analysis of Privacy Settings : Users on Facebook can share different types of data with others users. These types of data include real name and Profile photo of the facebook profile. Users can in fact choose to fill this information and update their information at any time. In this section, investigator start by investigating the awareness of modification of selected privacy settings and also analysis the reaction of facebook user who are also college students towards the unknown person's friend request. The results show that facebook user have significant privacy concerns, and claim to be fairly aware of privacy risks.

Conclusion : The results indicate, that most of respondents, who seem to be active users of Facebook, do disclose real name and profile photo . Furthermore, the privacy policy and terms of use of Facebook were largely known or understood by our respondents. Furthermore, the privacy policy and terms of use of Facebook were largely known or understood by our respondents that's why most of the respondent reject the friend request from unknown persons and also most of the respondent modify or change their facebook profile. Privacy is a complex construct and, as such, difficult to understand. Accordingly, there are many different factors that affect privacy behavior. Hence, more research into privacy awareness and related behavior on social networking sites is clearly called for.

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**STATUS OF WOMEN ENTREPRENEURSHIP AND MICRO FINANCE :
THE MANIPUR EXPERIENCE**

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Abstract

Globalization and economic liberalization with the doctrine of free markets have opened up tremendous opportunities for development and growth and consequent modification in livelihood strategies. In every society women play critical roles in the family and outside. Socio-economic advancement of a country can be judge best by the status and position of women. Women constitute half of the total population in the world Empowerments of women is a critical factor in the eradication of poverty through remunerative and non remunerative work at home, in the community and in the work place. Women in income generating activities is related to increase their status, role and decision making power in the family and in the society. The extension of small loans through Self Help Groups can help in the growth of micro enterprises in any region. Micro finance has evolved as need based policy and programme to cater the needs of neglected groups especially women, poor, rural deprived etc. Microfinance is one of the most effective and flexible strategy to fight against global poverty.

Key words : Microfinance, SHGs, Entrepreneurs, NGOs.

A women entrepreneur is regarded as multi-functional personality discharging different roles such as those of capitalists, an inventor, a promoter, a co-ordinator, a manager, an administrator, a risk-bearer, an innovator and a decision maker. So, her unemployment towards work, paucity of funds and imperfections of markets and other conditions, the functions of entrepreneur would be changed for time and place (Walokar Durga, 2001). As an entrepreneur, the women has to involve for establishing her enterprise regarding the idea generation and screening, determination of forms of business organization, product analysis, determination of objectives, project preparation, completion of promotional formalities, raising funds, procuring men, machine and materials (Khanka S.S. 1999). There should be a link between the entrepreneurial functions and the entrepreneur. Therefore, the activities of a women entrepreneur which she has to perform in an underdeveloped economy for successful operations of her enterprise are listed as:-

Undertaking of risks and the handling of economic uncertainties involved in business : Risk taking by a woman entrepreneur can be considered as a means of provision for establishing the enterprise and running it. Generally, women have more power of taking risk of any job. Therefore, an important function of an entrepreneur is to reduce uncertainty in her plan of investment as well as expansion of the enterprise. She assumes all possible risks of business considering the changes in market, consumers, techniques or production, new inventions and all the aspects directly or indirectly related to the enterprise. She tries to minimize the uncertainties by her initiative, skills and rational judgement.

Entrepreneurial decision-making : In order to keep best result for future prospects she should decide the nature and the type of product and the organisation. She should take the decision about everything that are essential for everything out and for changing in the size, location and process for the development of her enterprise.

Managerial-functions : The women entrepreneur has to plan everything, organises all the factors, resources and related aspects which were required for successful running of her business.

Innovations : Literary meaning of innovation is doing new things or the doing of things that are already being done in a new way. So, a woman entrepreneur should have to develop the idea for the improvement in the various aspects of business, considering the viability and feasibility of corresponding factors. There were no distinction in entrepreneurial function on the basis of sex. According to Frederick Harbison, the functions of women entrepreneur has classified into five categories as:- Exploration of the prospects of starting a new business enterprise. Undertaking of risks and the- Handling of economic uncertainties involved in business. Introduction of innovations or imitation of innovations Co-ordination, administration and control. Supervision and leadership. Better economic growth of a nation draws vital initiative from a stream of young and talented women entrepreneurs. So, the economic development of a nation depends on the function of effectiveness of women entrepreneurship. It is not much to say that India has remained less developed today because of lacking adequate entrepreneurship among women. Still, Manipur remains poor as compared to other states of India because of the absence of industrial units and also lack of women entrepreneurs. The role of women entrepreneurship in economic development is not unknown to use because the entrepreneurship has been playing a significant role in the development of business in India from the days of Indus valley civilization when our merchants were always ready with new products entering new markets, etc. As society changes over the years, the Indian economic scenario has also undergo a drastic change. Intensified competition has become the order of the day and entrepreneurship among Indian women is considered as the major means which links the socio-cultural milieu with rate of economic development. India in the past and even today, in some orthodox community, the rate of women entrepreneurial participation is dependent on a number of socio-cultural factors like caste, size of the family, economic status, level of education, customs, training, etc. Entrepreneurs help in generating employment both directly as well as indirectly, contributed to improvement in the living standard; facilitate establishment of forward and backward linkages.

According to Joseph A. Schumpeter, "the rate of economic progress of a nation depends upon its rates of innovation which in turn depends upon the distribution of entrepreneurial talent in the population. He further suggested that technical progress alone could not lead to economic development, unless technological breakthroughs are put to economic use by entrepreneurs (Gupta C.B. 2001). Economic development essentially means as process of upward change whereby the real per capita income of a country increase over a long period of time. Here, the entrepreneur acts as a key to the creation of new enterprise thereby increasing the economy of a country. Thus, the entrepreneurs both men and women initiate and sustain the process of economic development in the ways like:

Capital formation : Entrepreneurs mobilise the idle savings of the public through the issues of industrial securities. Investment of public savings in industry results in productive utilisation of national resources. Rate of capital formation increases which is essential for rapid economic growth. Thus, an entrepreneur is regarded as the creator of wealth.

Improvement in per-capita income : Entrepreneurs locate and exploit opportunities. They converted the latent and idle resources like land labour and capital into national income and wealth in the form of goods and services. They help to increase Net-National-Product and Per-Capita income in the country which are important yardsticks for measuring economic growth.

Generation of employment : Entrepreneurs generate employment both directly and indirectly. Directly, self-employment as an entrepreneur offers the best way for independent and honourable life. Indirectly, by setting up large and small scale business units they offer jobs to millions of people. Thus, entrepreneurship helps to reduce the unemployment problem in the country.

Balanced Regional development : Entrepreneurships in the public and private sectors help to remove regional disparities in economic development. They set up industries in backward areas to avail of the various concessions and subsidy offered by the Central and State Governments.

Improvement in living standards : Entrepreneurs set up industries which remove scarcity of essential commodities and introduce new products. Production of goods on mass scale and manufacture of handicrafts, etc. in the small sector help to improve the standard of life of a common person. These offer goods at lower costs and increase variety in consumption.

Economic independence : Entrepreneurship is essential for national self-reliance. Industrialists help to manufacture indigenous substitute of hitherto imported products thereby reducing dependence on foreign countries. Businessmen also export goods and services on a large-scale and thereby earn the scarce foreign exchange for the country. Such import substitution and export promotion help to ensure the economic independence of the country without which political independence has little meaning.

Backward and forward linkages : An entrepreneur initiates change which has a chain reaction. Setting up of an enterprise has several backward and forward linkages. For example, the establishment of a steel plant generates several ancillary units

and expands the demand for iron ore, coal, etc. These are backward linkages. By increasing the supply of steel, the plant facilitates the growth of machine building, tube making, utensil manufacturing and such other units. Entrepreneurs create an atmosphere of enthusiasm and convey a sense of purpose. They give an organization its momentum. The practice of entrepreneurship is as important to establish firms as it is to new ones.

Objectives : To study the growth and development of Self help Groups in Manipur. To enquire into the socio-economic origins of the entrepreneur belonging to Self Help Groups. To assess the qualitative and quantitative outcome of the Self Help Group members.

Hypothesis : SHGs provide opportunities for Self employment to large number of people particularly women in Manipur. If SHGs are properly developed, the unemployment problems can be solved to a great extent. SHGs are contributing a lot in the development of cottage and village industries in Manipur.

Self Help Groups in Manipur : Now-a-days SHGs are gaining popularity in rural and urban areas. The SHGs started playing an important role in the rural development. The World Bank Report (1991) has observed "women are central to success of poverty alleviation effort in the short and medium as in the long run". Manipur, a small land locked state belongs to the North Eastern Region of India. Traditionally man goes for employment and women look after household management. There are no industries, private companies or public sectors companies worth mentioning in the state of Manipur. The agricultural activities, kitchen gardening, handloom, weaving etc. are left to women. Traditionally women are physically strong and carried out rigorous hard work in agriculture sector. At the same time, they have acquired a special skill of traditional handloom, weaving, shawl making and knitting. They want to be economically independent and contribute in bringing the state out of economic crisis. So, Self Help Groups are becoming a significant market force in Manipur due to its socio-economic factors. Self Help Group was started, in 199K-^9 in Manipur with low institutional response. Although efforts were made by NGO and other bodies since 1990's, they couldn't achieve the momentum as in the case of other states. One of the good approaches for growth and development is Self Help Group. SHGs not only provide the member with an "opportunity to carry out economic activities but also discuss and analyse their social and economic situation to arrive at the root causes of their problems and strive to find out the solution. It is a forum for collective voice of the poor against common oppression and exploitation, to understand individual and problems and improve their skill and capacities and manage resources. SHG is the basis "for action and change" (Gupta, 1993). In order to incorporate the basic characteristics of viable SHG, it is important to promote SHG for the poor in a systematic fashion. Thus, the role of Self Help Promoting Institution (SHPI) becomes very important as it is not credit only but SHG operates. Looking into it conceptually, self help groups emerged as an institution which is small but a powerful change agent. It acts as a social institution as well as economic institution at the grassroots level.

The emergence of SHG is an outcome of several experiments conducted at the Saving and Credit Management Groups (SCMG), sponsored by Mysore Resettlement and Development Agency (MYRADA). National funding organizations like National Bank for Agriculture and Rural Development (NABARD), Small Industrial Development Bank of India (SIDBI) and Rastriya Manila Kosh (RMK) and government organization advocated forming of SHG and providing or linking with credit. The Institute of Cooperative Management (ICM) Imphal, a regional branch of National Council for Cooperative Training (NCCT), New Delhi undertook the NCUI - Women Cooperative Education Project (WCEP) in Imphal East in August 2000. The leading role played by this project is the process of gradual recognition of the key position in the micro finance through SHGs for strengthening the socio-economic base of rural development. In 2001, Manipur Rural Bank could help 55 SHGs with Rs. 4.45 lakh as loan. The UBI had gone ahead with 66 SHGs being helped by Rs. 15.75 lakh followed by SBI with only one. The number of SHGs in Manipur increased dramatically from 122 in 2001 to 571 in 2004-2005 registering the increased of 873 percent. The Manipur Rural Bank does better in terms of the number of SHGs while the SBI does better in terms of credit. The number has increased to 2338 SHGs by the end of 2006-2007 with an amount of Rs. 882.80 lakhs. And the number has also dramatically increased to 7229 with an amount of Rs. 3216.38 lakhs in 2008-2009. In Manipur, the SHG Bank linkage programme is making good progress.

Table No.1.
The status and trend of SHGs in Manipur 2002-2009

Particular	2002-03	2003-04	2004-05	2006-07	2007-08	2008-09
No. of SHG credit linked to bank	30	63	571	2338	4719	7229
Amount of bank loan disbursed(Rs. lakh)	-	11.20	241.66	882.80	637.84	3216.38

Source: State Focus Paper, NABARD, 2009 June

In Manipur there are 11 commercial banks, one regional rural bank and 4 co-operative banks. From Sept. 30, 2008, the participation of different Banks i.e. Vijaya Bank and Punjab & Sind Bank have started deposited linked with 5 SHGs and 29 SHGs respectively. Indian Overseas Bank and newly opened Axis Bank have not started with SHGs. State Bank of India has credit linked with 397 SFIGs under Swarnajayanti Grameen Swarajgar Yojana (SGSY) and 2119 SHGs directly with Rs. 412.45 lakhs and Rs. 1,372.59 lakhs respectively. Manipur Rural Bank has the maximum share in the SHG bank linkage programme in Manipur with 3414 SHGs with credit linked of Rs. 855.06 lakhs. As on June 2009, the total credit linked of 7229 SHGs of Manipur with various banks was to the extent of Rs. 3216.38 lakhs. The participation of Banks in the SHG bank linkage programme is given in Table 1.

Table No. 1.2
Status of the SHG- Bank linkage programme in Manipur as on June 2009

Sl. No.	Bank	No. of SHG with deposit		No. of SHG with Credit				Total	
		No. of SHG	Amt.	Under SGSY		Direct SHGs		No. of SHG	Amt.
				No. of SHG	Amt.	No. of SHG	Amt.		
1.	Commercial Banks	11005	1744.66	1331	736.83	2362	1491.77	3693	2228.60
2.	Regional Rural Banks	4544	98.57	7	5.00	3412	850.06	3414	855.06
3.	Cooperative Banks	1250	15.44	76	127.00		5.72	122	132.72
	Total	16799	1858.67	1409	868.83		2347.55	7229	3216.38

Source: SLBC, Manipur, June 2009.

The programme of SHGs started in Manipur fairly late and the state could not achieve the momentum when compared with other states like Andhra Pradesh, Karnataka and Tamil Nadu. In fact, if we could act on time, the capital and human base of the SHGs operating in Manipur could have been strengthened much more than what we see today. In the other words both qualitatively and quantitatively much remains to be done to improve the SHGs in Manipur.

Methodology : Manipur is divided into two tracts - hill and valley. The districts covered for the present study are- Ukhrul, Senapati, Tamenglong, Chandel and Churachandpur from the hill and - Imphal East, Imphal West, Thoubal and Bishnupur from the valley districts. The successful SHGs are found more in Imphal East and Imphal West Districts as compared to other remaining districts. The numbers of groups are not equally selected from each district. The selected number of SHGs from each districts are given in Table 1.3.

Table No. 1.3
District-wise selected number of SHGs

Sl. No.	Districts	No. of SHGs	No. of Women
1	Imphal East	40	80
2	Imphal West	20	40
3	Thoubal	9	18
4	Bishnupur	5	10
5	Ukhrul	5	10
6	Tamenglong	5	10
7	Senapati	5	10
8	Chandel	6	12
9	Churachandpur	5	10
	Total	100	200

Source: Field Survey

Need for the study : Entrepreneurship is essential for national self reliance. The factor that contributes to the development of women is the social mobility Women's mobility depends on the active participation and involvement in any developmental activities specially economic development. Women entrepreneur and labourer is a major thrust in the present economic scenario of Manipur. One of the most important factors for the success of any enterprises is the timely and sufficiently availability of institutional finance. The problem of unemployment is increasing by leaps and bounds in our society. The economic needs of family are increasing day by day compelling women to take up gainful employment outside the home. Self Help Groups work for the upliftment of the women. This study can be considered as an important contribution towards the development and growth of micro enterprises in Manipur. The vulnerable women specially rural women, if turned into entrepreneurs will not only place themselves into the saddle of gainful employment but also creates jobs for the placement of their status in the society. The self-employed women uplift themselves in the socio-economic



sphere. Apart from socio-economic changes, employment also provides some relief from the monopoly of home and routine work. Self Help Group is the only means for the development of socio-economic status of women particularly in the state of Manipur. Being a 'and locked state, the scope of setting up large and medium sized industries are also deemed. The only means for solving unemployment problem and tapping locally available resources is through fostering entrepreneurship in Self Help Groups in Manipur Vinayagamoorthy (2007) also stated that poverty and unemployment are the major problems of any underdeveloped countries to which India is not exception. In India, at the end of Five Year Plan 26.1 per cent of the population was living below poverty line. Self Help Group is a tool to remove poverty and improve the development process. So, this study is necessary to focus attention on the entrepreneurship development through Self Help Group coming up in the different districts of Manipur.

Finding : It is found from the study that all the factors related to SHGs are the main factors contributing to the success of the SHG. To confirm this variation of opinion held by SHG members with respect to these factors, χ^2 – test has been used and it is found to be highly significant at 5% level of significance with p-value <0.001. It is observed from the opinion given by the members that to get financial help at the time of emergency, to get socially and economically empowered and develop the habit of saving among women are the most and general expectation of SHG member for joining in the group. Most of the SHGs in Manipur are appreciated by the people due to their social and economic activities.

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FINANCIAL MANAGEMENT FEATURES IN EMERGING ECONOMIES (IN CASE OF UZBEKISTAN)

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Abstract

Uzbekistan being one of the rapidly growing countries in Central Asia is characterized as emerging economy. Nowadays, Uzbekistan Government encourages entrepreneurs/companies to manufacture high value added products and become competitive players in global market. Thus, Uzbekistan needs to develop and improve contemporary management systems; including financial management. This article includes interesting information about the history of development of financial management in Uzbekistan. Author tried to describe improvement trends of financial management system in Uzbekistan by using theoretical and scientific analysis. There were written some key issues for development of financial management systems. Author approached to financial management as a system which plays a vital role in development of the whole organization. There was explained financial management domain. It's notable that information system issues of financial management were also described. Paper shows the basic results of research aiming to investigate financial management issues in Uzbekistan. Availability of two things – systematic approach and principle of system is characterized as main condition to develop financial management systems.

Key words : financial management, financial data, financial resources.

Financial management is one of the most convenient and advanced tools that is used to confirm decision-making. Financial management deals with the analysis of profitability, taking into account the costs and projecting future financial results. The data received from financial management, influence the overall development strategy of the company, as they determine the financial requirements for the implementation of strategy. On the basis of the data received there are developed the scheme and structure of investments, investment sources, and there are substantiated data for outside investors.

Profitability analysis and cost accounting allow us to find new methods to control the financial flows of the company in short and long term perspectives. Implementation of the system of financial management gives the company an opportunity to identify their advantages, allowing forming an effective competitive strategy. Thus, the main task of financial management is to increase the market value of the company.

Description the Role and Significance of Financial Management : However, from our point of view, the available techniques and tools analyzed in the literature and used in the national practice, are not considered in the complex, in conjunction with the general system of management of the organization. Moreover, there are not taken into account the need of adaptation of financial management system of a commercial organization, adaptation to cyclical development of the organization. In fact, under the influence of changes in the environment organization changes at every historical stage of transition to market economy, moving from one phase of its life cycle to another. Consequently, there must be changed and the system of financial management (situational approach). Let's consider these interconnections. Operation of any economic entity in its development cycle phases consists of a large number of different processes and sub-processes. Depending on the phase of the cycle, the subject type, size and type of activity the individual processes can take a leading role in it, some can either be absent, or be in a very small size. However, despite the huge variety of processes, it is possible to identify the main ones which cover the activities of any commercial organization. These are manufacturing, sales, finance, and personnel management activities. Management of

each of these processes is an element or control subsystem in the overall system of organization's management. Thus, financial management is a system that has certain regularities and features, more precisely, a subsystem of company's management system. Its implementation aims to achieve general objectives of management. As a controlled system, financial management is largely susceptible to state regulation through taxes, licenses, tariffs, refinancing rates, etc. Controlled system means that financial management is the control object experiencing impact of flow of managerial decisions. Therefore, the basic principle in justifying the method of forming the system of financial management is the principle of system. On the other hand, financial management itself is a system of interconnected elements. We may see the following elements within its framework: organizational structure, personnel, methods, tools, information supply and technical tools that have an impact on the strategic and operational aspects of financial management. Thereby, the financial policy of the organization which mediates the solution of production issues and interconnections with budget, investors, owners and contractors is formed. Solutions of the latter, in turn, correct functioning of the system of financial management, and it is necessary to adapt to changes in the environment. It is important to note that the elements of the system of financial management should not work in isolation, but in conjunction with the life-cycle phases, taking into account the development of the organization. Only then we can talk about the system, and then there is appeared a synergetic effect, leading to the growth of productivity and (or) reduce production costs. With the development of organization information system of financial management undergoes changes. In the evolution phases of organization there is implemented the system of traditional financial accounting – developed forms of primary documentation, generated flow of financial management documents. For the purposes of internal accounting and making financial decisions there are only used some indicators of managerial accounting. With the increasing of sales volume and growth of organization information by financial accounting is no longer meets with the requirements of internal financial management, as designed for external regulators. Therefore, it is

necessary transition from individual indicators to the formulation of managerial accounting system and modernization of the information system in order to improve its efficiency. Decentralization of the organizational structure, allocation of cost-accounting units in the phase of stabilization leads to the necessity of organizing at the department level and creation of a consolidated information system that integrates these services. On the phase of the crisis, management implements restructuring of its business in order to avoid losses. In accordance with the changes in the organizational structure, the information flows change, and the authority to make financial decisions is concentrated in the upper levels of power.

View of Financial Management in Uzbekistan : The changes in Uzbek economy in accordance with the transition to market relations require from leaders of organizations to use new methods and approaches to management technologies, including the field of financial management. Analysis of financial and economic performance of some local companies shows that deterioration of their position is referred to the lack of professionalism and a systematic approach to financial management. At present some businesses in Uzbekistan are focusing on survival by selling liquid fixed assets, searching short term funding sources and diversification of production. But the lack of systematic approaches does not lead them to effectiveness of methods used and spray of available financial resources. Surely, to avoid such drawbacks, it is necessary to build an effective system of financial management within company. In Uzbekistan, certain elements of financial management were present at different stages of economic development, but in the full sense of this term financial management was not implemented. The transition to market economy leads to allocation of financial management functions from the state level and financial relations to self-organization within companies, which creates a formal framework for the implementation of financial management. In the functions of state there are remained the financing of social sphere, and in the commercial organization – self-financing of own development, so the welfare of the organization depends on the correctness of actions and responsiveness of management staff of this organization, rather than state funding. Originally professionals in the field of business economics, planners, accountants, analysts who have gone from accounting and settlement, building plans, forecasts and price calculations to preparation and decision-making on a wide range of company's resource management problems were dealing with the problems of financial management. The financial management was characterized with role of control, strict accounting and optimization of the production process. The latter is associated with the introduction of tax planning at the company. The next stage in the development of financial management was the development of universal rules and procedures for decision-making in this area, which allowed interpreting it as a set of common, standardized financial methods, procedures and technologies. The leaders of companies learn to make their own financial decisions on forming of financial resources and their structure, directions of in-

vesting funds, the use of new financial instruments. At the present stage of development of market relations when companies operate in an uncertain socio-economic environment, their managers understand the need for rapid changes in management, including elements of financial management. This leads to the need of implementation of the system principles. Analysis of different approaches to the definition of financial management domain allows researchers to conclude that the evolution of views on the subject of financial management in a concise, concentrated form repeats broadly historically developed and rotated postulates of good governance in general management. In a systematic manner the content of the stages of development of financial management in Uzbekistan is presented as following: First stage. Formation of independent field of financial management: Strict control, cost optimization and proper conducting of financial transactions; Second stage. Functional approach: allocation of functions of financial planning, organization and control, developing universal procedures for decision-making; Third stage. System approach: determining the elements of financial management system, definition of their interconnections. The evolution shown above is the objective development of theoretical justification of financial management caused by practical needs. Therefore, a number of authors of papers devoted to financial management gravitate toward several directions moving from one approach to another, because there is an objective need to rethink them.

Conclusion : In conclusion, we'd like to note that the financial management, on the one hand, is an art, since the most financial decisions focused on the future financial success of the company, which sometimes involves a purely intuitive combination of financial management methods, based, however, on the knowledge of the fine points of the market economy. On the other hand, it is a science, because acceptance of any financial decision requires not only knowledge of the conceptual foundations of financial management of the firm and scientific methods of their implementation, but also the scientific knowledge of the general laws of development of the market economy.

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GREEN ACCOUNTING : A CRITICAL LEGAL PERSPECTIVE

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Abstract

Sustainability of human beings depends on very large extent on the availability of natural resources for future generation. Conservation and accountable usage of natural assets is the responsibility of present generation. Government intervention in the form of law is considered as an important tool for making effective implementation of this responsibility in today's era. The key is not only to measure the total value of natural assets but also to measure the distribution of benefits, how much goes to each stakeholder group and the dependence of each group on natural capital especially the poor.

Key words : *green accounting, commerce, legal perspective*

Over the past few decades accelerated industrialization and rapid economic growth has resulted into over exploration of natural resources. Release of solid, liquid hazardous waste and emission of greenhouse gases by industrial sectors are posing threat to the very existence of mankind and the planet through environmental destruction. This would make clear how natural assets will be depleted and /or depreciated by the planned development. Green Accounting is basically adoption of valuation of natural capital integration in planning for development. Incorporating green accounting into national economic accounts could provide a measure of sustainability; however, considerable advanced methods of measurement and valuation are needed. From a purely accounting perspective, particular forms of capital could be diminished or, in an extreme case, wholly eliminated without decreasing overall welfare if other forms can be substituted for it. There are, of course, no substitutes for the life-sustaining services of nature and the question of when and how to account for this fact is the source of many ongoing debates in green accounting. Natural capital is a critical asset, especially for low-income countries where it makes up a significant share (36%) of total wealth. For these countries, livelihoods of many subsistence communities depend directly on healthy ecosystems. Incorporating natural capital into national accounts can support better decisions for inclusive development. GDP only measures gross output. It tells us nothing about income for the long term. It does not answer questions like -Are income and growth sustainable? Will the same level of income be available for our children? That's because GDP looks at only one part of economic performance—output—but says nothing about wealth and assets that underlie this output and the generation of income. For example, when a country exploits its minerals, it is actually depleting wealth. The other major limitation is the poor representation of natural capital. Important contributions to the economy of forests, wetlands, and agricultural land are not fully captured in national accounts or may be hidden. Forestry is an example—timber resources are counted in national accounts, but forest carbon sequestration is not included. Other services like water regulation that benefits crop irrigation are hidden and the value is (wrongly) attributed to agriculture in a country's GDP. It is in the interest of developed and developing countries to move beyond traditional GDP and start incorporating their natural capital into their national accounts to make better economic decisions.

Green Accounting : Green accounting is an accounting system that measures the currently unaccounted for economic

losses that are experienced by renewable and nonrenewable resources in the environment. By incorporating these losses into all levels of economic accounting, all parts of the economic sectors can make informed decisions that support long term sustainable development and help strengthen human rights affected. Natural capital includes, first of all, the resources that we easily recognize and measure such as minerals and energy, forest timber, agricultural land, fisheries and water. It also includes ecosystems producing services that are often 'invisible' to most people such as air and water filtration, flood protection, carbon storage, pollination for crops, and habitat for fisheries and wildlife. These values are not readily captured in markets, so we don't really know how much they contribute to the economy and livelihoods. We often take these services for granted and don't know what it would cost if we lose them. The concept of accounting for natural capital has been around for more than 30 years. However, progress in moving toward implementation has been slow. Human rights and the environment are inextricably linked and in respect to sustainable development, natural allies. Ecosystem services – including food, clean water, medicinal substances, recreation, and protection from natural hazards such as floods and droughts are indispensable to the well-being of all people in all places. Loss of such services will increasingly threaten humanity's 'right to development'. Almost from the emergence of contemporary concern with environmental protection in the late 1960s, the impact of environmental sustainability on the enjoyment of human rights was strongly perceived. The linkage figured prominently in the United Nations Conference on the Human Environment, held in Stockholm in 1972. A major step towards achieving this vision came recently with the adoption by the UN Statistical Commission of the System for Environmental-Economic Accounts (SEEA). The SEEA provides an internationally agreed method, on par with the current SNA, to account for material natural resources like minerals, timber, and fisheries. The challenge now is to build capacity in countries to implement the SEEA and to demonstrate its benefits to policy makers. Natural capital accounting can provide detailed statistics for better management of the economy. For example land and water accounts can help countries interested in increasing hydro-power capacity to assess the value of competing land uses and the optimal way to meet this goal. Ecosystem accounts can help biodiversity-rich countries design a management strategy that balances tradeoffs among ecotourism, agriculture, subsistence livelihoods, and ecosystem services like flood protection and

groundwater recharge. Ecosystems accounting not only provides a tool to maximize economic growth but is also a means to measure who benefits and bears the cost of ecosystem changes, helping governments gauge whether their growth is inclusive. Following the recent adoption of the System for Environmental-Economic Accounts, there is now wide acceptance of the need to put natural capital accounting into action. As a result, there is renewed momentum with finance ministries and ministries of environment who want to show the contribution of natural capital to national income. Countries that have started implementing the SEEA have a road map to guide them through this process. They begin by establishing institutional structures with clear lines of responsibility and commitments across government departments. Rather than taking on the challenge of compiling all natural capital accounts at once, countries are prioritizing which sub-accounts to begin with, based on important development challenges facing them.

Sustainability and Comprehensive Wealth : An application of consistent and comprehensive theoretical framework is required for assessing whether economic growth is compatible with sustaining well-being over time. This approach differs from earlier approaches by concentrating on wealth rather than income. The sustainability requirement is that a properly-defined comprehensive measure of wealth must be maintained through time. Our wealth measure is unusually comprehensive, capturing not only reproducible and human capital but also natural capital in its various aspects, health improvements (beyond those in human capital), and technological change. Several economic effects not mediated through the market are given emphasis. We consistently integrate population growth to arrive at changes in comprehensive wealth per capita. We apply the framework to five countries that differ significantly in stages of development and resource bases: the United States, China, Brazil, India, and Venezuela. We show that the often-neglected contributors to wealth – technological change, natural capital, and health capital – fundamentally affect the conclusions one draws about whether given nations are achieving sustainability. Indeed, even countries that manage to maintain per-capita wealth (that is, achieve sustainability) differ considerably in the kinds of capital that contribute to this accomplishment. The inclusion of health capital makes a huge difference to our estimates of changes in per-capita wealth. The value of this capital is more than twice that of all other forms of capital combined. As a result, health capital's growth rate largely determines the growth rate of comprehensive wealth.

Waves - Wealth Accounting and Valuation of Ecosystem Services : The World Bank has launched a 5-year global partnership on Wealth Accounting and Valuation of Ecosystem Services (WAVES), a program to implement green accounting in a critical mass of countries, both developed and developing. Launched by President Robert B. Zoellick at the Convention on Biological Diversity meeting in October 2010 in Nayoga, Japan, the project will last for five years with the implementation phase from 2012-2015. WAVES promotes sustainable development worldwide through the implementation of comprehensive wealth accounting that focuses on the

value of natural capital and integration of "green accounting" in more conventional development planning analysis. WAVES will enable more informed decision making - targeting Ministries of Finance and Planning and Central Banks - to support sustainable development and genuine green growth. WAVES provides a broad platform including the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), other UN agencies, developed and developing nations, international organizations, NGOs and academics.

Major Components of Waves : The Objectives are Implementation of natural capital accounting in 6-10 countries: Colombia, Mexico, Uganda, Madagascar, Philippines, India, Norway, UK (Australia, Canada, Japan); Incorporate natural capital accounts in policy analysis and development planning; Contribute to methodology for ecosystem accounting for the SEEA; and Promote adoption of natural capital accounting beyond the pilot countries. Natural Capital Accounting Components include Monetary value of ecosystem services produced annually and cost of degradation; Distribution of benefits and burden of degradation among different stakeholders; and Value of natural capital assets and Comprehensive Wealth accounts. Related Issues include Scaling up to national level and Maintaining spatial characteristics Valuation Techniques could be Market prices for provisioning & recreational services and Other techniques for regulating services, drawing on models such as ARIES and InVest

Legal Perspective at National Level: India currently does not have a system of "green accounting" and that economists estimate gross domestic product (GDP) as a broad measure of national income, while net domestic product (NDP) accounts for the use of physical capital. "As yet we have no generally accepted system to convert gross domestic product into green domestic product that would reflect the use of precious depletable natural resources in the process of generating national income, At national level, lawmakers in many countries have drafted constitutional and legislative provisions setting forth the right to an environment of a specified quality, such as healthy, safe, secure, clean, or ecologically sound. Some 130 constitutions in the world, including the overwhelming proportion of those amended or written since 1970, include a state obligation to protect the environment or a right to a safe, healthy, ecologically (adjective) environment. The protection of the environment and the promotion of human rights are increasingly seen as intertwined, complementary goals, and part of the fundamental pillars of sustainable development. The two fields share a core of common interests and objectives indispensable for sustainable development. Each human being depends on ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment. At the same time, all human activities have an impact on the environment. A global green economy will necessitate an emphasis on coordination and implementation, better incorporating public, private, and civil society, including at the national and sub-national levels. This will require multilevel governance. Many existing institutions at both the global and the national level have the mandate to address environmental pro-

tection, while others are devoted to human rights. Both sets of institutions face a variety of challenges related in part to the need for greater cooperation across sector the need for coordinated responses at multiple levels. In particular, there is no comprehensive international agreement addressing these matters in a holistic manner, nor is there a single agency addressing the problems. The lack of coordination among different agencies and treaty bodies has had some negative effect on the success of integrative laws and policies and should be a priority issue for the future. India expects to put in place, in five years, a system of green national accounting that will take into account the environmental costs of development and reflect the use of precious natural resources in the process of generating national income. Union Minister of State for Environment and Forests Jairam Ramesh says he has set the ball rolling for a system of green national accounting in India, by 2015 at least.

Conclusion: Green accounting is the popular term for environmental and natural resource accounting, which incorporates environmental assets and their source and sink functions into national and corporate accounts. The path of environmental protection and vindication of human rights violations has a long fought legacy that has taken on many forms—conventions, institutions, court cases, and even military ac-

tion. For all this work, the international community still wrestles, more than ever, with the ability to create lasting peace, as well as ensuring human dignity is preserved. Although no greater hope can be realized when environmental and social well-being is completely harmonized across the globe, the current injustices require a flexible and resource approach to achieving redress. One such approach is pursuing compliance with internationally standards of accounting natural capital as a part of preparation of Green National Accounts.

Abbreviations:

NCA	National Capital Accounting
SEEA	System for Environmental-Economic Accounting
WAVES	Wealth Accounting and Ecosystem Services
GDP	Gross Domestic Product
GNP	Gross National Product
NDP	Net Domestic Product

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Abstract

Behavioral economics have provided insights about consumer behavior in a way that can help us understand consumer preferences and decision making in a better way. Standard economic theory assumes that people make economic choices on the basis of perfect self-interest. This simplifying assumption is useful to understand the concept of economic utility. However study of social preferences through the lens of behavioral economics and psychology points out that people do value the fairness of outcomes for others. They also reciprocate by punishing or rewarding the economic agents with whom they transact, even if they have to incur costs for this reciprocity. This paper highlights fairness perception and other regarding preferences of consumers and economic agents through thought experiments. There are four findings that the authors present in this paper. First: People empathize with the loss making economic agents and are willing to incur costs to transact with them. Second: Fairness perception of consumers gets modulated by the urgency of the need. Third: Consumer's expectation of positive reciprocity increases with the strength of loyalty with their suppliers. Fourth: Stability of prices and wages is appreciated by people.

Key words : Fairness, reciprocity, social preferences, consumer ecosystem, consumer preference, empathy, customer markets, labor markets

Evaluation of economic outcomes is done by people as gains and losses relative to some reference point with more sensitivity towards losses than towards gains (Kahneman & Tversky, 1979). It has been shown that previous transactions between consumer and producer provides reference level of consumer surplus and producer profit to which the consumer and producer are entitled respectively (Dual Entitlement). Fairness of the economic outcome of the transaction are judged based on these entitlements, (Kahneman, D., Knetsch, J. L. & Thaler, R., 1986). It can be observed in day to day economic transactions, especially in those economies where business transactions are not well protected by law, that firms avoid using legal recourse in case of disputes due to complexities and waste of time. Implicit fairness norms often govern business relationships and prevent people from being unfair to others because they want long term relationships which are key for survival in competitive business environment. How these social norms gets established is a complex phenomenon and difficult to understand. Business transactions are usually strategic wherein firms having long term vision and plans. Social preferences in strategic relationships can have significant role for aggregate social and economic outcomes, (Fehr and Gächter, 2000, Camerer and Fehr, 2006). Ultimatum games experiments have shown that it is not only firms that have strategic orientation but people act strategically in decision making and are averse to inequity. The aversion is not only towards disadvantageous inequity but also towards advantageous inequity, (Fehr, E. & Schmidt, K. M. 1999). One possible reason for aversion towards advantageous inequity is that people do not evaluate individual utility in isolation but evaluate utility of the community or ecosystem in which they exist. Being fair is crucial for a healthy community and long term survival of the individual which is part of the community. The present paper discusses how fairness perceptions affect economic decision making of consumers. The paper is divided into four sections, each section presents a finding and evidence supporting the finding. Research methodology used in the paper is thought experiments.

1. Empathy towards loss making economic agents and willingness to incur costs to transact with them

Rational decision making model and the concept of utility is built on the assumption of perfect self-interest of homo economicus. However many social preference studies in Behavioral Economics have provided sound evidence that people exhibit other regarding preferences and they care for fair behavior. They also incur cost to punish unfair behaviors and prefer fairness not only for themselves but for others too. In this section the authors show that consumers are able to empathize with the losses incurred by their suppliers. They are also willing to incur costs to keep transacting with them which may be treated as an evidence for the empathy.

Consider the following thought experiment.

1.1 You have two sources to procure vegetables for your daily consumption

- A. Many small scale vegetable vendors by the street side forming a small market
- B. A supermarket in your locality

Prices of vegetables in the supermarket are lower by around 10% compared to that offered by the unorganized small scale vegetable vendors. (You come to know from the local newspapers that the supermarket is selling the vegetables at a loss to compete with the vegetable vendors).

Where will you prefer to buy the vegetables from?

N = 98

- | | | |
|----------------------------------|----|------|
| A) Small scale vegetable vendors | 60 | (41) |
| B) Supermarket | 38 | (57) |

In the first frame of the above question, even though offered a 10% discount, people (61.2%) prefer to buy from small scale vegetable vendors. In India mostly these vendors are below poverty line people. The preference for buying from these vendors may be due to empathy of people for the needs of these vendors for sustaining their livelihood. In the second frame it is explicitly mentioned that the supermarket suffers losses due to the offered discount. In this frame the preference gets reversed and 58.1% of people prefer to buy from supermarket. Since the supermarket is suffering loss, people

prefer to buy from supermarket so that they can support the supermarket. In the first frame the small scale vegetable vendors were less powerful and in the second frame the supermarket was weaker. People's fairness and social utility function may consider supporting the weaker of the economic agent.

Consider another thought experiment

1.2 Three suppliers A, B, C supply same product X at same price INR 10,000 per product to you

They all depend only on you for their business and survival. (Due to rise in labor costs at its geographical location, the production cost of A has risen and it is beyond its control). [Due to wasteful use of resources and mismanagement of funds, the production cost of A has risen]. So firm A had to increase the price to INR 12,000.

On yearly basis you need 120 unit of product X and you used to buy 40 units from each of the firms A, B and C. Now considering the scenario of increased price by A. What would be your preferred number of units you wish to buy from A, B and C

N=98

A : B : C

- | | | | |
|----|--------------|------|------|
| a. | 40 : 40 : 40 | (25) | [25] |
| b. | 20 : 50 : 50 | (67) | [30] |
| c. | 0 : 60 : 60 | (6) | [43] |

It is clear that due to the increase in prices by A, the firm will incur costs in case it still decides to buy from A at INR 12,000/- instead of INR 10,000. Still in both the frames significant number of subjects (93.8% in first frame, 56.1% in the second frame) responded to buy at least some number of units from A. However in the first frame, the increase in the cost of the product is not in the control of the supplier. So here very few subjects want to stop transaction (6.1%) and show willingness to continue to buy either as before or reduce the quantity bought, but wants to continue the relationship with A. However in the second frame wherein people come to know that the cost escalation is due to a factor that is in control of the supplier and thereby would have been controlled. A significant number of subjects (43.8%) prefer to stop buying from such inefficient supplier and they do not consider it to be their responsibility to support such a vendor. The responses thus highlights other regarding preference of economic agents. Customers require products for their needs and look for firms who can supply so that their needs are fulfilled. On transacting with the customer, the supplier becomes a part of consumer's ecosystem. In this ecosystem firms enter and exit depending on the fairness perception of the consumer. The consumer is willing to give the fair and positive entitlement (profits) to the firms as they want them to remain healthy and keep offering products to fulfil her needs. The empathy towards loss making entity can be reasoned as a need of the customer to maintain choices by avoiding the elimination of the supplier which incurs losses.

2. Primacy or urgency of the need and perception of fairness

It has been shown that people treat opportunistic selling as unfair, (Kahneman, D., Knetsch, J. L. & Thaler, R., 1986). When there is a shortage or a sudden rise in demand compared to

supply, there is an opportunity for the firm to exploit this shortage by increasing the price and maximize its profits. As per standard economic theory this is perfectly fine, and it should happen this way. But such exploitation is judged as unfair according to the fairness norm of society or community. This causes a resistance to increase in prices or in case of employers a decrease in wage and thereby causing sluggishness/stickiness in prices and wages, (Akerlof 1979; Solow 1980; Okun 1981). People tend to value entitlements/contracts and any violation to their entitlement is coded as unfair. Kahneman, D., Knetsch, J. L. & Thaler, R. (1986). However the contracts are not only legal but also psychological or social and are implicit. These social norms or implicit contracts needs to be respected or else it may affect negatively the goodwill of the firms, which is a key ingredient of sustainable business.

In the present paper author links such fairness perceptions with the primacy or the urgency of the need. To further elaborate the viewpoint, consider the following thought experiment.

2.1 There is a local firm supplying tents for use in picnics and adventure, selling at the rate of INR 500 per m² of material. Recently there have been floods in Kashmir, lot of people became homeless and they needed tents for temporary stay until the government makes arrangement. (One of your relative is also trapped in the floods). The tent manufacturer increased the price to INR 1000 per m²

Rate this action of the tent supplier

N = 98

- | | | | |
|----|-----------------|----|------|
| a. | Completely Fair | 4 | (4) |
| b. | Acceptable | 12 | (41) |
| c. | Unfair | 60 | (31) |
| d. | Very Unfair | 22 | (22) |

Here the need is primal, which is need for survival during a natural calamity. This need is critical but the criticality is intensified in the question by asking the subjects to imagine other but unrelated people in the situation of the floods against imagining their relative in the situation. As per the responses, though people feel the opportunistic pricing of the supplier as unfair, the willingness to pay (as reflected by the Acceptance label) increases significantly in case of second frame. As the criticality intensifies from the first frame to the second frame, people view the overpricing as more acceptable. In the first frame 12.2% people consider the rise as acceptable, in the second frame 41.8% of people label the increase in price as acceptable. Imagining one's own relative in the flood makes the need for tents more urgent and critical. Hence they realize the increase in price as more acceptable considering the situation and let the market clear more easily which is as per the standard economic theory. Another way to view the point is that if choices become constrained and need becomes salient, people start compromising on the implicit fairness norms. So the fairness perception gets modulated by the urgency of the need.

3. Expectation of reciprocity in case of long term economic relationships

When a consumer frequently buys products from the same supplier, it is known as customer loyalty in marketing parlance. We can also view this phenomenon as a psychological ecosystem of the consumer. A consumer has many firms /

economic agents in her psychological ecosystem. More loyal the customer to the firm, more close the firm is in the ecosystem. Firms whose mind share is negligible will be far away from the consumer in her psychological ecosystem.

One of the finding of the paper is that more loyal a consumer to her supplier, more will be the expectation of fairness and reciprocity that the supplier should exhibit towards her.

Consider the following thought experiment.

3.1 Its summer vacation time and people are travelling a lot. So availability of railway tickets is a problem. (You book railway tickets via one of the many of travel agents, depending on their availability.)[Since last 10 years you book all your travel ticket through the same travel agent]. On an average the agent has been charging INR 200 per ticket, but due to the season now asks for INR 400 per ticket

Rate the action of the agent as

N = 98

a. Completely Fair	(23)	[11]
b. Acceptable	(45)	[27]
c. Unfair	(24)	[52]
d. Very Unfair	(6)	[8]

In the first frame people are more acceptable to the increase in charges of the travel agents realizing the demand supply gap. 68.0% of people consider the opportunistic pricing of the agents as either completely fair or acceptable. However in the second frame where they have a relationship with a particular travel agent since last 10 years thereby sharing a loyal relationship, people perceive increase in charges by her to be unfair. Around 61.2% of people in the second frame label the opportunistic increase in commission charges as either unfair or very unfair. This may be because of the raised expectation of reciprocating with fairness due to the long term loyal relationship shared with the agent. As the person has become integral part of the psychological ecosystem of the consumer through a long term economic relationship, her asking for a higher price is termed as unfair. This also points out that in circumstances of unfair treatment by those suppliers to whom consumers are loyal, consumers may punish by breaking the relationship and finding new suppliers. Hence loyal customers are like double edged swords. If they are treated well and entitled to their consumer surplus, they are happy and will stay. But if their fairness perception is disturbed by violating the entitlement without a sound basis or miscommunicating the basis, they will tend to punish by walking away from the loyal customer base.

4. Importance of stability of prices in consumer market and wages in labor market

It has been shown by many authors that wages are sticky and firms are reluctant to reduce the wages during recessions. This sluggishness of wages has been attributed to resistance of firms to disturb the morale of the employees as it may affect the productivity adversely, (Akerlof 1979; Solow 1980). In case of customer markets also even though there are markets and circumstances where the firms are in a monopolistic positions but still are unable or are reluctant to raise the prices as they feel it is detrimental for the long term profits of the firms considering consumer may label such price rises as opportunistic and thereby unfair, (Okun, 1981). Firms do not charge

higher prices due to concern for goodwill among their customers and treat the costs as investment in goodwill. (Akerlof, 1980, 1982). As for example after almost 15 years Yanni is coming to India for performing and the tickets are being sold at INR 5000 (basic) amidst huge demand compared to constrained supply. Though there is clear opportunity to increase the prices and thereby profits, the organizers do not implement such pricing strategy as auctioning the tickets. Similar is the case during cricket matches in India.

Firms do have sensitivity towards fairness perception of the consumers and their actions are guided by implicit fairness norms of the consumer. It seems such sensitivity towards fair prices is one of the essential characteristics of a firm with long term vision. Incomplete adjustment in the consumer and labor markets suggest that there are constraints to these adjustments. In the present study, the authors carry out a thought experiment, where they try to give a possible alternative explanation for the stickiness observed in wages and prices. Consider the following two thought experiments, the first one for understanding stable prices and the second one for stable wages.

4.1 Consider two firms manufacturing a certain type of cookies. Production costs and MRP of both the firms are same. Company A frequently varies the MRP of the cookies depending on the rise and fall of input / production costs, even if these are small changes.

Company B tries to maintain stable prices, absorbing small costs during rising production costs and enjoying small profits during reducing production costs.

As a consumer which firm you feel has a better approach towards setting MRP prices?

N = 98

A) 47

B) 51

4.2 Consider two firms offering a wage of INR 200 per day to its workers.

Company A frequently varies the wages of the labor depending on the growth scenario. During good demand of its product, it increases the prices while during lesser demand it reduces the wages. There are no long term contractual arrangement.

Another Company B has a different approach. It has long term contracts with laborers and maintains a fixed wage over 5 year period, irrespective of the industry growth or slump / recession.

Which firm you feel has a better approach towards wages?

N = 98

A) 35

B) 63

In case of the first question, as per the standard economic theory, prices should adjust quickly with the changes in input costs and demand supply gap. However as per the responses, significant number of people (52.0%) value stable prices. Varying the prices frequently has its own costs and complexities for the firms as well as consumers. Larger the size of the firm, more complex it is to vary the prices frequently. From the consumer's standpoint it is also difficult for a consumer to evaluate the fairness of prices which vary frequently. This is

because the reference level of consumer surplus and producer profit which is used to evaluate fairness becomes dynamic, which brings ambiguity to the consumer. Such ambiguity is aversive and consumers prefer stable prices.

In case of labor market, stable wages are preferred more clearly than frequently varying wages. 64.2% respondents feel the approach of Firm B of stable wages to be more appropriate. It seems that closely linking the wages with market is not a good idea as certainty of income has its own value. The predictability helps the workers to manage their home finances. Hence many firms have contractual arrangement with laborers for stable wages for contract periods which workers accept.

Discussion : The derivation of aggregate demand and supply curves determine prices. The concept of equilibrium and market clearing in Economics is a very useful tool for understanding customer markets. Firms use this information for the pricing decisions. However customer and labor markets do not always clear as there are constraints which have basis in individual and social psychology. We may also call these constraints as modulators of equilibrium as these factors modulate the equilibrium prices/wages. A consumer is an individual and she has relationships with her suppliers for her needs. The set of suppliers forms a consumer ecosystem within which a consumer transacts. Firms enter and exit depending on certain factors. One of the important factor is the utility that the consumer derives from economic transactions. However this utility is not individual or isolated. It is highly interdependent relationship. This is where the utility becomes social rather than individual. From this interdependent needs fairness norms may have emerged which govern economic transactions between consumers and firms. These norms are implicit and are not enforceable by law but acts as guiding force for economic transactions.

Trust in economic transactions can have significant consequences for the consumers. Such trust is limited and people are skeptical of the behavior of the other during economic transactions. To counter this distrust in a cost effective manner, fairness norms gets evolved overtime. Such norms may have cultural influences. People are willing to incur costs by reciprocating positively or negatively in order to protect these fairness norms, thereby directing the behavior of people around them towards fairness. How these fairness norms and the perception of fairness gets changed is important to understand as it decides the reciprocity of the consumers.

Conclusion : What decision a firm takes when an opportunity arises to raise the price has important aggregate economic consequences due to established fairness norms of consumers. Historical prices acts as reference price and consumers and firms are entitled to their surplus and profits respectively based on this reference price. The present paper highlights four findings regarding what are the other psychological factors that can possibly alter the fairness norms of consumers. The findings are - First: Overriding the perfect self-interest hypothesis, consumers do exhibit other regarding preferences and show empathy towards loss making economic agents. They are also willing to incur costs to transact with such agents. Second: Consumer's decisions are guided by fairness norms but these norms can get modulated or relaxed depending on the urgency or the primacy of the need. Third: More loyal a consumer more will be her expectation of positive reciprocity from her supplier. This indicates that loyal consumers need to be handled by companies by care as they may have the propensity to punish their suppliers in case they are treated unfairly as per their fairness norms. Fourth: Failure of the consumer and labor markets to clear may be attributed to preference of people for stable prices and wages. People show aversion towards frequent changes in prices and wages.

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Abstract

This paper examines the relationship between gross domestic product (GDP), gross domestic savings (GDS) and gross domestic investment (GDI) for India during the period 1951- 2012. Vector Error Correction Method and co-integration techniques are used for analyzing the relationship between gross domestic product (GDP), gross domestic savings (GDS) and gross domestic investment (GDI) in this study. The Johansen co-integration test indicates gross domestic product (GDP), gross domestic savings (GDS) and gross domestic investment (GDI) are co-integrated, and that a long-run equilibrium exists between them. The Vector Error Correction test reveals that there is unidirectional causality running from gross domestic savings (GDS) and gross domestic investment (GDI) to gross domestic product (GDP) in the short run as well as in the long run. It means gross domestic savings (GDS) and gross domestic investment (GDI) lead to gross domestic product (GDP) but gross domestic product (GDP) does not lead to gross domestic savings (GDS) and gross domestic investment (GDI).

Key words : Economic Growth, Saving, Investment, Causality, Co-Integration. VECM**JEL Classifications:** C02, C22, E20, E21

Saving and investment are two key macro variables with micro foundations, which can play a significant role in economic growth, inflation stability and promotion of employment. National savings are critically important to help maintain a higher level of investment which is a key determinant for economic uplift' so it is necessary to analyse saving investment behavior for policy implications. The role of domestic saving and domestic investment is important for promoting economic growth. The central idea of Lewis's (1955) traditional theory was that increasing savings would accelerate growth, while the early Harrod-Domar (1939) models specified investment as the key to promoting economic growth. On the other hand, the neoclassical Solow (1970) model argues that the increase in the savings rate boosts steady-state output by more than its direct impact on investment because the induced rise in income raises savings, leading to a further rise in investment. Jappelli and Pagano (1994) also examined that saving contribute to higher investment and higher GDP growth in the short-run. The classical growth models support the hypothesis of saving promoting economic growth and Carroll-Weil hypothesis contradicts with the argument. The Carroll-Weil hypothesis (Carroll and Weil, 1994) states that economic growth that contributes to saving, not saving to growth. In the Indian context, though empirical studies exist on the role of saving and investment in promoting economic growth. Some empirical studies support the classical growth theory, some studies agree with the Carroll-Weil hypothesis and some do not support either of these. To illustrate, Sinha (1996) looked at the causality between the growth rates of gross domestic saving and economic growth, and found that there was no causality running in either direction. In a another study, Sinha and Sinha (2008) examined the relationships among growth rates of the GDP, household saving, public saving and corporate saving for the period 1950 to 2001 and found that economic growth produced higher saving in various forms and it was never the other way around. Ritu Verma (2007) employed the ARDL co-integration approach to determine the long run relationship of GDS, GDI and GDP for the period 1950-51 to 2003-04 and supported the Carroll-Weil hypothesis that saving does

not cause growth, but growth causes saving. Ramesh Jangili (2011) examines the direction of the relationship between saving, investment and economic growth in India at both aggregate level and sectoral level for the period 1950-51 to 2007-08 by using Granger causality test. It is empirically evident that the direction of causality is from saving and investment to economic growth collectively as well as individually and there is no causality from economic growth to saving and investment. It appears that there is no comprehensive study available on the analysis of the interdependence between saving, investment and economic growth. Therefore, this study investigates the possibility of saving investment led growth and growth driven saving investment hypothesis, in detail, by testing for Granger causality between the logarithms of saving, nominal investment and nominal GDP in India.

Review of Literature : Sinha Dipendra (1996) in his paper "Savings and Economic Growth in India" found that both gross domestic saving and gross domestic private saving are co integrated with GDP. However, causality tests between the growth of gross domestic saving the growth of private domestic saving and the growth of GDP indicate that the causality does not run in any direction. Agrawal (2001) examines the causality between GDP and saving for a number of Asian countries. He found evidence that higher savings rates cause higher growth rates in Bangladesh and Pakistan and higher growth rates cause higher savings rates in India and Sri Lanka. Reetu Verma (2007) in her paper "Savings, Investment and Growth in India" The study found that savings do not cause growth, but growth cause savings in India. Sinha, Dipendra and Sinha, Tapen (2007) worked on the relationship between per capita saving and per capita GDP for India using the Granger causality Data are for 1950-2004. The results show that there is no causality between per capita GDP and per capita household saving/per capita corporate saving in either direction. P. K. Mishra, J.R. Das and S.K. Mishra (2008) estimated the relationship between savings and investment for India. They found that the gross domestic investment causes gross domestic savings and gross domestic savings also causes gross domestic investment in India. That means there is bidirectional causality between gross domestic investment and

gross domestic savings. Ramesh Jangili (2011) in his paper "Causal Relationship between Saving, Investment and Economic Growth for India" examines the direction of the relationship between saving, investment and economic growth in India at both aggregate level and sectoral level for the period 1950-51 to 2007-08 by using Granger causality test. It is empirically evident that the direction of causality is from saving and investment to economic growth collectively as well as individually and there is no causality from economic growth to saving and investment.

Research Design

In this study, annual data is used from 1951 to 2012. All the data were collected from HAND BOOK OF INDIA (RBI) 2012-13. Variables used in this study and the definitions are GDS (log of Gross Domestic Savings), GDI (log of Gross Domestic Investment) and GDP (log of Gross Domestic Product) The data is analyzed to determine the causality between Saving, Investment and Growth. Before analyzing the causal relationship between Saving, Investment and Growth, data has been transformed in to natural logarithms, and then possible existence of unit roots in the data is examined. The stationarity of each series is investigated by employing Augmented Dickey-Fuller unit root test. The number of lagged differences included is determined by the Schwarz Information Criterion and Akaike Information criteria. Further proceed with the VAR lag order selection criteria to choose the best lag length for the VAR time series model to examine the Granger Causality test for all the series is performed. Johansen co-integration test is also applied to test for co-integration. The basic empirical investigation has two purposes. The first one is to examine the long-run relationship between Saving, Investment and Growth while the second is to examine the short-run dynamic causal relationship between Saving, Investment and Growth. The basic testing procedure requires three steps. The first step is to test whether the variables contain a unit root to confirm the stationarity of each variable. This is done by using the Augmented Dickey-Fuller tests (ADF). In the second step we test for the existence of a long-run co-integrating relationship between the variables. This is done by the use of the Johansen co-integration test. Finally, the last step, if all variables are integrated of same order and co-integrated then short run and long run causality test can be computed using the vector error correction model (VECM) method suggested by Engle and Granger (1987).

Results

Result of Stationarity Test : One of the most important attributes of a time series variable is its order of integration. Hence, we first perform unit root tests in levels and first differences in order to determine the order of integration of the series. To test the order of integration, we employ the conventional augmented Dickey-Fuller (ADF) test.

Table : 1

Result of Unit Root Test Using Augmented Dickey Fuller Test

Variable	At Level		At First Difference		Conclusion
	ADF	Prob.	ADF	Prob.	
Gross Domestic Product (GDP)	6.1989	1.0000	-4.3354	0.0000	I (1)
Gross Domestic Saving (GDS)	1.9065	0.9856	-2.2280	0.02312	I (1)
Gross Domestic Investment (GDI)	9.4162	1.0000	-8.0201	0.0000	I (1)

It is evident from the above table that the calculated ADF

statistics for level variables are less than the critical values in all cases, suggesting that the variables are not level stationary. Table 1 also shows that the ADF statistics for all the variables imply first-difference stationary.

Result of Lag Order Selection Criteria for GDP, GDS and GDI: For getting optimal lag Length for co integration analysis, we have used five criteria namely, LR test statistic, Final prediction error, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. All the criteria have suggested a lag length of 1 as a optimal lag length.

Table 2

VAR Lag Order Selection Criteria for GDP, GDS and GDI

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-79.94951	NA	0.003686	2.910509	3.018038	2.952299
1	161.0551	448.1840*	1.08e-06*	-5.230004*	-4.799888*	-5.062846*
2	168.8161	13.61583	1.13e-06	-5.186531	-4.433828	-4.894005
3	170.5996	2.941142	1.46e-06	-4.933319	-3.858029	-4.515425
4	179.4070	13.59739	1.49e-06	-4.926561	-3.528684	-4.383298
5	186.0706	9.586205	1.65e-06	-4.844581	-3.124117	-4.175950

* indicates lag order selected by the criterion

LR : sequential modified LR test statistic

HQ : Hannan-Quinn information criterion

FPE : Final prediction error

AIC : Akaike information criterion

SC : Schwarz information criterion

Result of Co-Integration Test Based on Johnson Juselius Method :

Once we have the results of unit roots, the next step is to determine whether there exists co-integration, using the same order of integrated variables. To test for co-integration, the Johansen and Juselius (1990) procedure was used, which leads to two test statistics, trace test and maximum eigenvalue test, for cointegration.

Table: 3

Result Of the Co-integration Test based on Johnson Juselius method

Johansen Test for Co-integration (Trace Test)					
Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	0.01 Critical Value	Prob.	Conclusion
None	41.34210	29.79707	35.65	0.0015	One Co integrating Relationship
At most 1	4.751758	15.49471	20.04	0.8346	
At most 2	0.639225	3.841466	6.65	0.4240	
Johansen Test for Co-integration (Maximum Eigen value Test)					
Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	0.01 Critical Value	Prob.	Conclusion
None	36.59034	21.13162	25.52	0.0002	One Co integrating Relationship
At most 1	4.112533	14.26460	18.63	0.8473	
At most 2	0.639225	3.841466	6.65	0.4240	

Table3 express the results of the co-integration test. There are two test statistics for co-integration, the Trace test and Maximum Eigen value test. The Trace-Statistic value is shown to be greater than the critical values at both 1% and 5% levels. Therefore, we reject the null hypothesis of no co-integrated equation among the variables. Thus, we conclude that there is at most one co-integrated equation among the variables. The results of Maximum Eigen value test statistics also express

same here. Finally, we can say that there is a long run relationship between gross domestic product (GDP), gross domestic saving (GDS) and gross domestic investment (GDI).

Result of Granger Causality Test Based on VECM:

Long run Causality Test Based on VECM: The VECM long run causality result presented in Table 4 revealed the causal relationship among gross domestic product (GDP), gross domestic saving (GDS) and gross domestic investment (GDI). The result showed that the error correction term for co-integrating equation with gross domestic product (GDP) as a dependent variable is negative and significant at one percent, implying that there exists a strong long run relationship running from gross domestic saving (GDS) and gross domestic investment (GDI) to economic growth (GDP). The coefficient of error correction term with gross domestic saving (GDS) as a dependent variable was observed to be insignificant, implying that no existence of long run causality was observed from gross domestic product (GDP) and gross domestic investment (GDI) to gross domestic savings (GDS). The coefficient of error correction term with gross domestic investment (GDI) as a dependent variable was observed to be insignificant, implying that no existence of long run causality was observed from gross domestic product (GDP) and gross domestic saving (GDS) to gross domestic investment (GDI).

Table : 4

Long run Causality Test Based on VECM:

Causality	ECM _{t-1}	T-Statistic	Prob.	Result
Long run causality from GDS and GDI to GDP	-0.271273	-5.996765	0.0000	Causality exist
Long run causality from GDP and GDI to GDS	-0.001265	-0.201070	0.8414	No Causality
Long run causality from GDP and GDS to GDI	-0.087222	-0.858891	0.3941	No Causality

Short run Causality Test Based on VECM/ Block Exogeneity Wald Tests: Multivariate Short run Causality Test Based on VECM/Block Exogeneity Wald Tests present in Table 5 revealed the short run causal relationship among gross domestic product (GDP), gross domestic saving (GDS) and gross domestic investment (GDI). The result showed that the short run unidirectional causality running from GDS and GDI to GDP. Result also expressed that the short run unidirectional causality running from GDS to GDI.

Table: 5

Shortrun Causality Test Based on VECM/ Block Exogeneity Wald Tests

Causality	Coefficient	T-Statistic	Result
Short run causality from GDP to GDS	-0.606238	-0.6188	Uni directional Causality
Short run causality from GDS to GDP	0.166866	2.0743**	
Short run causality from GDP to GDI	0.439189	-0.8588	Uni directional Causality
Short run causality from GDI to GDP	-0.207630	-2.8559***	
Short run causality from GDS and GDI	0.795127	3.886470***	Uni directional Causality
Short run causality from GDI to GDS	-0.385994	-0.6173	

** and *** denotes significant at 5% and 1% respectively.

Conclusion : In this paper, we have examined the relationship between gross domestic product (GDP), gross domestic saving (GDS) and gross domestic investment (GDI) in India using time series data from 1951 to 2012. This study uses the ADF unit root test, Johansen co-integration and Vector Error Correction techniques to investigate the long run and short run causality between gross domestic products (GDP), gross domestic saving (GDS) and gross domestic investment (GDI) in India. From the above study, it can be concluded that the Augmented Dickey Fuller unit root tests show that GDP, GDS and GDI series become stationary when first difference are considered. The empirical result reveals a long run co-integrating relationship between gross domestic products (GDP), gross domestic saving (GDS) and gross domestic investment (GDI) in India. We also found evidence of unidirectional causality running from GDS and GDI to GDP in the short run as well as in the long run. It means GDS and GDI lead to GDP in the short run as well as in the long run. However, GDP does not lead to GDS and GDI in the short run as well as in the long run.

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ANALYTICAL HIERARCHY PROCESS FOR IDENTIFICATION OF ATTRIBUTES FOR TPM IMPLEMENTATION

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Abstract

Total Productivity Maintenance is one of the effective strategy designed primarily to maximize the effectiveness of equipment throughout its entire life by the participation and motivation of the entire workforce. The paper presents the Analytic Hierarchy Process (AHP) methodology for the implementation of Total Productivity Maintenance (TPM) in an organization. A TPM implementation methodology has been developed for identification of weight and priorities of TPM attributes by using pair-wise comparison (PCM) method of AHP. The result of this paper is evident that TPM can bring in commendable reforms and improvement in terms of equipment effectiveness, better products quality, meeting promised delivery and conducive work place and may be very useful for strategic and operational decisions.

Key words : AHP, TPM, PCM

Efficiency and effectiveness of equipment plays a dominant role in service sector to determine the organizational performance and smooth functioning of all the equipment with the servant as. For more than two decades, the development of the service sector had registered an excellent performance and attracted a large number of capital investments. These excellent performances have enabled the service providers to enjoy an important competitive advantage in the global market, especially in terms of cost and quality. Many organizations began to realize that the continuity of this excellent performance must be supported by a strong backbone of efficient and effective equipment. Traditional maintenance technicians are regarded as passive and non-productive to the current requirement. Hence, implementing Total Productive Maintenance (TPM) in the service industry has emerged as an important operational strategy to overcome the losses due to equipment inefficiency. TPM is an innovative approach, which holds the potential for enhancing the efficiency and effectiveness of equipment by taking advantages of abilities and skills of all individuals in the organization. TPM and its implications received prestigious worldwide recognition in achieving the ultimate *Zero Defects* and *Zero Breakdown* targets. In modern day manufacturing and service industries, improved quality of products and services increasingly depend upon the features and conditions of the organization's equipment and facility. In order to survive every industry has to strive for improving productivity in all spheres of activities. Hence it is logical to utilize the resources like machinery, men, and material as optimally as possible (Krishnaiah, 1995). As automation and labor saving equipment take production task away from humans, the condition of production and once equipment increasingly affects output, quality, cost, delivery, health, and safety and employee morale. TPM is beginning to make the transition from a repair department to that of high level business function. TPM transcends this conventional approach in transforming the responsibility of a department into a companywide culture of autonomous maintenance by everyone, aimed at not just preventing the breakdowns, but also at making the machinery live up to its full potential (Majumdar 1998), however this would not be possible without TPM. In

1971, the Japanese Institute of Plant Maintenance (JIPM) defined the following goals covering the entire life of the equipment in every division including planning, manufacturing, and maintenance.

Maximize equipment effectiveness.

Develop a system of productive maintenance for the life of the equipment. Involve all departments that plan, design, use, or maintain equipment in implementing TPM. .

Actively involve all employees – from top management to shop floor workers.

Promote TPM through motivation management: autonomous small-group improvement activities (SGIA).

It would be very difficult to achieve the most cost effective objective if the business is continued to be operated in a very functional way, regarding the condition of machinery and equipment as the sole responsibility of maintenance department. Traditionally there are barriers between production and maintenance personnel related to machine operations and its maintenance. One of the bad results has been a traditional lack of further development training for skilled maintenance craftsmen once their apprenticeship has been completed (Spratling 1987). This often results in undue reliance on maintenance contracts with suppliers of original equipment and an erosion of in-house skills. Loss of in-house experience in maintenance, and of ownership of maintenance problems, has a devastating effect over time. It adds up to subcontracting a core part of the business.

Some multinational organization quoted that poor maintenance practices is a major reason for relatively poor manufacturing performance (HMSO 1970). It would be unfair to present TPM without referring to some of the ideas and practices which have developed in the past, and which form an essential part of an integrated maintenance strategy. Many excellent concepts such as preventive maintenance and terotechnology have originated. The terotechnology means the coordination of several disciplines means a combination of management, financial, engineering and other practices applied to physical assets in pursuit of economic life cycle costs' (HMSO 1975). It is a multidisciplinary approach to optimizing the life cycle costs of plant and buildings. Life cycle costs include the specification and design for reliability and main-

tainability, installation, commissioning, maintenance, and replacement. New ideas like condition-based maintenance (HMSO 1979) were swept up and included in the terotechnology philosophy. Although a broad-based concept, it did not become a 'total' company philosophy. The earlier maintenance techniques such as reactive maintenance, preventive maintenance, predictive maintenance, proactive maintenance, and reliability based maintenance do not sound most promising in improving the effectiveness of machine and manufacturing system.

Analytical Hierarchy Processes : AHP provides a proven, effective means to deal with complex decision making and can assist in identifying and weighing criteria, analyzing the data collected and expediting the decision-making process (Kalpande et al, 2013). It is used to calculate weight ages and confirm the consistency. An AHP can have as many levels as needed to fully characterize a particular decision situation. A number of functional characteristics make AHP a useful methodology. These include the ability to handle decision situations involving subjective judgments, multiple decision makers and the ability to provide measures of consistency of preference. Designed to reflect the way people think, AHP continues to be the most highly regarded and widely used decision-making method. The Analytic Hierarchy Process (AHP) is a theory of measurement through pair wise comparisons and relies on the judgments of experts to derive priority scales (Saaty, 2008). It is these scales that measure intangibles in relative terms. The comparisons are made using a scale of absolute judgments that represents how much more; one element dominates another with respect to a given attribute. The research (Kodali and Chandra, 2001, Kalpande et al, 2013) has used the AHP for identification of weightages parameters used for TPM and TQM.

Identification of TPM Attributes : TPM is a unique Japanese system which has been evolved from the PM concept (preventive or productive maintenance) which was originated and developed in USA (Kodali and Chandra, 2001). The goal of interval based preventive maintenance (PM) is to provide control of planned maintenance activities rather than allow machine breakdowns (Pardue *et al.* 1994). The corrective maintenance (CM) means to improvement of equipment so that equipment failure can be eliminated. The maintenance prevention (MP) is an activity to design the equipment to be maintenance free. TPM is not a mere combination of MP-CM-PM but it emphasizes promoting maintenance through 'autonomous maintenance' by encouraging small group activities (Nakajima 1982). The concept of TPM lays much emphasis in maximizing the equipment effectiveness by eliminating all forms of inefficiencies, hindering capital, material and labor productivity. The mechanics of achieving such spectacular rise in equipment effectiveness is through the involvement of all employees in the organization belonging to various departments like production, maintenance, technical services and stores. This is possible when all employees channel their energies in a specific direction without adopting a compartmentalized segmented approach. According to Kodali and Chandra (2001) the role of maintenance is gradually upgraded by training, developing new machines and processes, preparing for fast response to breakdowns and higher level maintenance. TPM provides a platform for horizontal integration of employees to tackle any equipment related problem in a multidisciplinary fashion (Krishnaiah 1995). When employees accept this point of view, they will see the advantage of

building quality into equipment and building an environment that prevents equipment and tools from generating production or quality problems. The starting point for such changes in attitude must be within the top team.

The main attributes derived from TPM are:

Productivity : Productivity implies development of an attitude of mind and a constant urge to find better, cheaper, easier and safer means of doing a job, manufacturing a product and providing a service. The output is obtained by the combined input of a number of factors such as men, material, machine and energy etc. Productivity in relation to machines, materials, workers is measured in terms of output per machine hour, per unit measure of a particular material and per man-hour respectively.

Quality : Quality is the measure of an organization to provide better acceptable products/services to the customer. TPM system offers an organization the means to produce more usable products/services that meets customer approval.

Cost : A cost reduction programmed means maximization of profits by reducing costs through economics and savings in the cost of manufacture, administration, selling, distribution and use. Idling of men and improper supervision is visible waste. Waste of time is a hidden but most precious waste (Chandra, 1991).

Delivery Performance : Delivery performance is the ability of the supplier to provide the required type and the number of items according to schedule (Korgaonkar 1992).

Safety : Safety and hygiene constitutes the foundation stone of the preventative approach in achieving the goals of industrial health, as it deals with identification, assessment and control of environmental factors harmful to the health of employees (Mehta 1998).

Morale : Morale is used to describe the overall group satisfaction (Newstorm and Devis 1998). Small group activities in the factory should be based on participative management. Small group goals should be the same as company goals to improve productivity and working conditions (Nakajima 1989). In order to produce extraordinary results organizations have to depend a great deal on the group culture, motivation programmes, suggestion schemes and team spirit.

Work Environment : Quality of work life programmers yields benefits such as improved inter/intra communication better employer-employee relationships, better career development, reduced stress, high confidence and self management (Gondhalekar 1996).

Competitive Advantage : A competitive advantage is defined not by cost alone but by the total time (gestation period) required to produce a product or service, dependable deliveries, rapid design changes, after sales services, rapid volume changes, consistent quality, loyalty and sustainable commitments towards customers promises. In any industry the firm with the fastest response to customer demands has the potential to achieve an overwhelming market advantage (Chandra and Kodali 1998, Everett and Ronald, 1998).

With the help of extensive literature review (Kodali and Chandra, 2001; Everett and Ronald, 1998, Korgaonkar 1992) and discussions held with experts the selection of attributes has been determined which is used in AHP model for the justification of TPM are given below and the schematic of the model is shown in figure 1 where Improve Productivity [IP], Improve Quality [IQ], Reduction in Cost [RC], Delivery Performance [DP], Safety and Hygiene [SH], Morale [Mo], Work Environment [WE] and Competitive Advantages [CA]

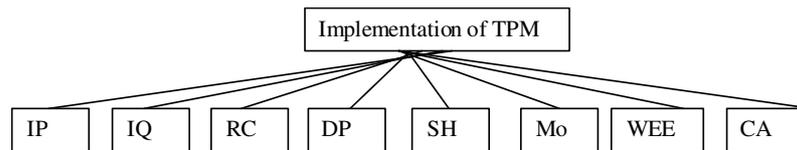


Figure 1

The schematic Diagram of AHP Model for TPM

Implementation of AHP Technique

After identification of various attributes of TPM, the decision for prioritizing attributes is carried out by AHP. Comparing these attributes and defining their importance over each other are done using the PCM. Giving importance ratios for each pair of alternatives, a matrix of pair-wise comparison ratios is obtained. For reducing uncertainty and doubt about alternatives to allow a reasonable choice to be made among the selected CSF is checked by calculating the consistency ratios (CR).

However in practice it has unrealistic to expect the decision-makers provide pairwise comparison matrices which are exactly consistent especially in the cases with a large number of alternatives. The consistency of expert opinion can be monitored by using CR. Therefore, AHP is a reliable way to synthesize expert opinion for this analytical context. Saaty suggested that a CR less than 0.10 or 10% is considered adequate. If CR more than 0.1 or 10% the inconsistency of judgments within that matrix has occurred and the evaluation process should therefore be reviewed, reconsidered and improved (Crowe et al., 1998; Saaty, 2008). The CR is used as the main indicator of ranking consistency, is then calculated by dividing the consistency index (CI) μ value by the random consistency index (RCI) value. The RCI is obtained from a large number of simulation runs and varies depending upon the order of matrix (Kannan, 2008). Table 1 shows the value of RCI for matrices of order 1-15 obtained by approximating random.

Table 1
Fundamental Scale of Absolute Numbers for RCI

Order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RCI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.54	1.56	1.58	1.59

Source: Saaty, 2008

Source: Saaty, 2008

The criteria might also have different importance compared to each other. Therefore a pair-wise comparison matrix is considered for the criteria. Elements of this matrix are pair-wise or mutual importance ratios between the criteria which are decided on the basis that how well every criterion serves and how important it is in reaching the final goal.

For creating the pair-wise comparison matrix in the PCM, Saaty has employed a system of numbers to indicate how much one criterion is more important than the other. These numerical scale values and their corresponding intensities are shown in Table 2 and called as Saaty's Fundamental Scale.

Table 2
Fundamental Scale of Absolute Numbers

Intensity	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate value	When compromise is needed
Reciprocals Of above	If activity <i>i</i> has one of the above nonzero numbers assigned to it when compared with activity <i>j</i> , then <i>j</i> has the reciprocal value when compared with <i>i</i> .	A logical assumption

Source: Saaty, 2008

In order to compare homogeneous elements whose comparison falls within one unit, decimals are used. If the elements of the pair-wise comparison matrix are shown with C_{ij} , which indicates the importance of i^{th} criterion over j^{th} , then C_{ji} could be calculated as $1/C_{ij}$ (Boroushaki and Malczewski, 2008). The AHP method employs different techniques to determine the final weights; one of the methods is geometric mean. According to Buckley (1985) the weights in pair-wise comparison matrix of attributes and sub-attributes are calculated by following formula.

$$r_i = \left(\prod_{j=1}^n a_{ij} \right)^{1/n}$$

Where, r_i represents the geometric mean of i^{th} criterion at which a_{ij} ($i, j= 1, \dots, n$) are the comparison ratios in the pair-wise comparison matrix and n is number of alternatives. The relative priority of each criterion or weightage is then calculated by normalizing this column by dividing each value by the total of the column (or the sum of the geometric mean values)

$$W_i = \frac{r_i}{\sum_j r_j}$$

Where, w_i represents the relative priority of i^{th} criterion. *Consistency ratio in the AHP:* However in practice it is unrealistic to expect the decision-makers provide pair-wise comparison matrices which are exactly consistent especially in the cases with a large number of alternatives. Expressing the real feelings of the decision makers generally lead to matrices that are not quite consistent. However some matrices might violate consistency very slightly by only two or three elements while others may have values that cannot even be called close to consistency. A measure of how far a matrix is from consistency is performed by CR. Han and Tsay (1998) explained that having the value of λ_{max} required in calculating the CR. This is obtained by calculating matrix product of the pair-wise comparison matrix and the weight vectors and then adding all elements of the resulting vector. After that a CI (μ) is introduced as-

$$\mu = \frac{\lambda_{max} - n}{n - 1}$$

Where, λ_{max} is the biggest eigenvalue at which n is the number of criteria. RCI is the consistency index of a pair-wise comparison matrix which is generated randomly. Random index depends on the number of elements which are compared and as it is shown in Table 1. The final CR is calculated by comparing the CI (μ) with the RCI.

$$CR = \frac{\mu}{RCI}$$

The CR is designed such a way that shows a reasonable level of consistency in the pair-wise comparisons if $CR < 0.10$ and $C.R. > 0.10$ indicate inconsistent judgments.

Result Analysis and Testing

In this study, identified attributes of TPM is compared with each other on the scale of attribute by various experts in the field of TPM. The experts were selected randomly without affecting their uniformity. The consistencies of the responses were determined by calculating a consistency ratio (CR) for each response. The final weight-ages or priorities of attributes were calculated by taking mean of the eight responses, which shown in Table 3. To test the accuracy of the responses, student's t-distribution were used, as the sample size is less than thirty. The Saaty's Fundamental scale of absolute numbers is used for pair-wise comparison matrix.

For the 99 % confidence level and sample size, $n = 8$ the distribution of t statistic from 7 ($n-1$) degree of freedom (Dof) is 2.998. As all t-calculated values of mean of attribute shown in Table 3 are less than 2.998 (Walpole et al, 2007, (Table of Critical Values of the t-Distribution)). i.e. $t_{cal} = \text{Around } 0.5 < 2.998 = t_a$ with $\alpha = 0.005$ and $v = 7$ Dof, the process is under control.

Table 3 shows the final weightage of each attribute and its T-distribution value. The top level priorities are improving quality; improve productivity and reduction in cost respectively. The second and middle level priorities are competitive advantages and delivery performance and bottom level priorities are work environment, safety and hygiene and morale respectively.

Table 3
Summary of Weightage of TPM Attributes

	IP	IQ	RC	DP	SH	Mo	WE	CA	Avg of Crite.Priority	T-dist
IP	0.342	0.110	0.157	0.490	0.318	0.389	0.318	0.449	0.322	0.379
IQ	0.584	0.321	0.529	0.466	0.453	0.329	0.398	0.590	0.459	0.330
RC	0.098	0.074	0.096	0.203	0.218	0.087	0.075	0.087	0.117	0.455
DP	0.058	0.057	0.053	0.062	0.068	0.075	0.128	0.077	0.072	0.472
SH	0.045	0.057	0.039	0.026	0.024	0.085	0.053	0.045	0.047	0.482
Mo	0.057	0.037	0.029	0.026	0.032	0.022	0.031	0.012	0.031	0.488
WE	0.055	0.070	0.053	0.027	0.049	0.055	0.063	0.024	0.049	0.481
CA	0.068	0.084	0.099	0.052	0.078	0.087	0.085	0.067	0.077	0.470

Conclusion : It was observed that the developed AHP model works adequately and yields acceptable results in attributes selection for TPM implementation. AHP is used to justify TPM and confer the adequacy of TPM implementation. The identified weight and priorities can be very useful for strategic and operational decisions. From the result it is apparent that TPM can bring in remarkable improvements in term of equipment effectiveness, better products quality with promised delivery. In future, the identification of sub-attributes of these attributes may provide the in-depth study of TPM and will help for identification of key parameters which helps to improve the business performance.

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PERFORMANCE EVALUATION OF A WIRE MESH SOLAR AIR HEATER

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Abstract

A solar drier integrated with a matrix solar air heater having an area of 6 m^2 was developed and undertaken a detailed performance analysis to explore the techno-commercial feasibility of the system. The maximum temperature recorded at the outlet of the air heater was 70°C , when the system was subjected to no loaded condition. The dryer was loaded with 30 kg fresh tomato of 4 mm thick slices. The initial moisture content of 90.62 % reduced to 18.28 % in 3 hours. The economics of the drier was analyzed in detail by three methods namely annualized cost, present worth of annual savings and present worth of cumulative savings. The payback period worked out to be 1.05 years, which was much less than the estimated life of the system (20 years). The cumulative savings of the dryer at the end of 20 years was estimated to be Rs. 28,52,503.00

Key words : Solar drier, porous bed solar air heater, tomato drying, moisture content, economic analysis

Nomenclature

A_p	area of absorber plate (m^2)
C_c	capital cost of drier (Rs.)
C_p	specific heat of air ($\text{kJ/kg}^\circ\text{C}$)
d	rate of interest on long term investment
F_R	collector heat removal factor
F'	collector efficiency factor
h_e	effective heat transfer coefficient (W/mK)
I	intensity of solar radiation (W/m^2)
i	inflation rate
\dot{m}	mass flow rate ($\text{kgm}^{-2}\text{h}^{-1}$)
N	payback period (year)
S_1	saving during first year for solar dryer (Rs.)
T_1	inlet temperature ($^\circ\text{C}$)
T_a	ambient temperature ($^\circ\text{C}$)
U_L	overall heat loss coefficient

Greek symbols

ζ	overall efficiency factor (%)
α	solar absorptance
δ	transmittance of glass cover
$(\delta\alpha)_e$	effective transmittance absorptance product

Improving the quality of agricultural produces is always remaining as a challenge to the producers. In fact, superior quality product hails more capital investment and advanced technology, which together leads to increase in energy consumption and production costs. Storage of product is an important stage after post harvesting, wherein a considerable quantity and quality loss of product is observed. Drying is considered as an ancient method of food preservation. Open sun drying is the common method practiced in developing countries for drying wheat, paddy, spices, fruits, vegetables, etc. This method alleges many disadvantages: drying depends on weather conditions and hindrance due to birds, animals, and also wind washes away considerable food quantity. The preservation of organoleptic characteristics (odor, flavor, texture and color) and nutritional values of dried products is also an important parameter during drying process (Bennamoun & Belhamri, 2003). Technological advancements facilitate high quality drying but resulted in enormous energy consumption and costly

equipments. Hence, solar driers are considered to be best alternatives to overcome the disadvantages of traditional method and the use of fossil fuel (VijayavenkataRaman, Iniyar, & Goic, 2012). Solar driers are classified into two namely direct and indirect types. In direct type, the product is exposed directly to the solar radiation. A solar air heater is connected to a drying cabinet in indirect type, which protects the products from direct exposure to solar radiation. Flat plate collectors are the conventional type of solar air heater and in order to improve the efficiency, several modifications in design have been evolved out over many years of research. One such design is matrix collector in which a wire mesh absorber is used instead of a flat plate. There is a considerable thermal enhancement in such kind of collectors and this is due to the influence of geometrical parameters of absorber matrix such as depth to bed element size ratio, porosity of the bed and extinction coefficient (Ahmad, Saini, & Varma, 1995). Many researchers have designed and studied matrix solar air heaters with different mesh parameters. Aldabbagh, Egelioglu, & Iilkan (2010) analyzed single and double pass solar air heater with wire mesh as packing bed. The collector design consists of 10 layers of steel wire mesh as absorber. The porosity of the packing was above 0.85. System was studied for different mass flow rates. Another design by Dhiman, Thakur, & Chauhan (2012) had 2 mm thick aluminium sheet as absorber plate and several layers of wire mesh screens packed one above the other. Thermal and thermo-hydraulic performance of the system for parallel and counter flow was studied both theoretically and experimentally with varying bed porosities and mass flow rates. The study reported that thermal efficiency of packed bed heater decreased as the porosity increased. The effect of using fins in between the wire mesh absorber was studied by El-khawajah, Aldabbagh, & Egelioglu (2011). In their study, twelve sheets of steel wire mesh arranged in 6 layers with 3, 3, 2, 2, 1, 1 sheets from bottom to top respectively. The diameter of the wire used was 0.02 cm with $0.18 \text{ cm} \times 0.18 \text{ cm}$ cross sectional opening of the layers. Results show that thermal efficiency increases with increasing mass flow rate between 0.0121 kg/s and 0.042 kg/s and maximum efficiency reached 85.9 % at

0.042 kg/s. Copper screen matrix of 1.5 m² area was studied by Kolb, Winter, & Viskanta (1999). The study was conducted with varying duct heights and mass flow rates. The results showed that the thermal performance depends on mass flow rates and it was least affected by channel height. The matrix air collector yielded higher thermal performance with less friction losses compared to flat plate air collector. Thermo hydraulic performance of wire screen matrix was analyzed and proved that the performance is higher compared to conventional flat plate collectors by Mittal & Varshney (2006). Optimization of bed parameters like number of mesh layers, pitch to diameter ratio and porosity for maximum efficiency was presented by Paul & Saini (2004). Different tests and analysis like transient behavior (Al-Nimr, 1993), performance in terms of energy augmentation ratio (Gupta & Kaushik, 2009), dimensionless analysis to study the effect of different boundary conditions (Sodha, Bansal, & Mishra, 1984), effect of recycle ratio on the heat transfer efficiency enhancement (Ho, Lin, Chuang, & Chao, 2013), economic analysis for drying application (Aravindh & Sreekumar, 2014) of matrix solar air heaters were reported. Though the efficiency of the wire mesh solar air heater over other conventional type air heaters are studied theoretically and experimentally, their application on drying of agricultural products is seems to be rare as published work. In this work, an attempt has been made to design a pilot scale air heater with wire mesh absorber. The developed air heater was integrated with a drying cabinet and performance under loaded condition was tested with drying tomatoes.

Performance Equation : The generalized performance equation of a conventional solar air heater is given by

$$\eta = F_R \left[(\tau\alpha)_e - U_L \frac{T_1 - T_a}{I} \right] \quad (1)$$

Where η is the overall efficiency of the collector, F_R is the collector heat removal factor and U_L is the overall heat loss coefficient.

$$F_R = \frac{\dot{m}c_p}{U_L A_p} \left[1 - \exp\left(-\frac{F' U_L A_p}{\dot{m}c_p}\right) \right] \quad (2)$$

$$F' = \left[1 + \frac{U_L}{h_e} \right]^{-1} \quad (3)$$

F' is the collector efficiency factor; h_e is the effective heat transfer coefficient.

Experimental Setup and Procedure

Experimental Setup : The experimental set up as shown in Fig. 1(a) essentially consists of matrix solar air heater, blower and a drying chamber. The area of solar air heater is 6 m² with length and width of 2 m and 1 m respectively. The developed dryer consists of two parts: solar air heater and drying chamber. The peculiarity of the design is that the food is protected from direct exposure to sun. This type of indirect drying helps to retain the color of the agricultural products. The collector consists of an outer glass cover, two layers of wire mesh followed by a bottom plate and then finally an insulation layer. The upper cover is made up of toughened glass of 4 mm thickness and 90% transmissivity. The bottom plate is made

up of Aluminum (Al) coated with selective paint of higher absorptivity. The schematic diagram of the wire mesh absorber is shown in Fig. 1(b). The absorber comprises of two parallel layers of selective coated wire mesh made up of Galvanized Iron (GI), which is separated by a spacing of 2 mm each other. The diameter of the wire is 1 mm and pitch is 3.175 mm. Introducing wire mesh with smaller diameter and lower porosity of packing between the glass cover and the bottom plate improves the efficiency significantly, due to the turbulence provided by the packing in the airflow passage (Choudhury & Garg, 1993). The bottom and sides are insulated with 50 mm thick polyurethane foam (PUF) with a thermal conductivity of 0.16 W/mK, shown in Fig. 1(c). The inlet area of the air passage of the collector is 172 cm².

A centrifugal blower is provided to suck the hot air. The volume flow rate of the blower is 500 m³/h. The blower blows the hot air into the drying chamber where the product is loaded for drying. The dimension of the chamber is (140 cm × 70 cm × 94 cm). The loading capacity of the chamber is 30 kg fresh product per batch with 10 trays made up of Stainless Steel (SS). The wall of the chamber is made up of 50 mm PUF sandwich with SS304/GI. The collector is mounted at 12° with respect to horizontal surface according to the latitude of the place.

Experimental Procedure : Experiments were conducted at Pondicherry, India with Latitude and longitude of 11.56°N and 79.53°E respectively. Basically two types of studies were undertaken on the system: no loaded and loaded condition. The experiments were conducted during the months of December 2013 and May 2014. The average day light hours of the December month was 11 hours and that of May was 12 hours. The daylight hour or sunshine hour is dependent on the latitude of the place and the hour angle.

Working : The photons utilized for solar thermal applications belongs to the wavelength ranging from 0.2μm (middle ultra violet) to 3.5μm (middle infra red) region of the electromagnetic spectrum. The photons emitted from the sun gets absorbed by the absorber plate material. The absorbed photons induce molecular vibration, increasing kinetic energy of the molecules. This in turn increases the temperature of the absorber plate. When solar radiation falls on the toughened glass of the collector, it gets transmitted. The radiation passes through the black painted GI wire mesh. The absorber mesh absorbs the radiation and converts it into thermal energy i.e. long wave radiation. The long wave radiation cannot pass through the glass and thus it bounces back. The ambient air enters through the collector duct and passes through the wire mesh. Meanwhile it acquires turbulent flow due to the friction factor in the geometry. The turbulent flow enhances the thermal conductance of the fluid. The absorber plate which is in higher temperature transfers the heat to the fluid according to the thermodynamics first law. The hot air is drawn towards drying chamber by centrifugal blower which is used for removing moisture.

Instrumentation : Intensity of solar radiation was recorded using LP 471 Pyranometer with an accuracy level of 1°. RTD temperature sensors with 0.1°C accuracy placed at required points measured the temperature and was connected to a

951D-16U universal datalogger for recording the temperatures. A digital weighing machine ($\pm 0.001\text{g}$) of Model No. TTB 31 (Make-Wensers weighing scales limited) is used to measure the weight of the samples. A hot air oven (Make: Techniq, Model: 341P, 0-250°C) was used for estimating the moisture content of the product.

Economic Analysis : Economic analysis was done by comparing the solar dryer with electric dryer, assuming that the market value of solar dried product is equivalent that of product dried through a conventional dryer, say electric dryer. Sreekumar. et. al, 2008 used similar economic analysis to determine the cost-effectiveness of a solar dryer developed for drying agricultural crops. Three methods were used for carrying out the economic analysis. First one is annualized cost method. This method is used to calculate the cost of drying for the starting year using solar drier and compared with electric dryer. The calculation involves capital cost, salvage value, debt interest rate, capital recovery factor and maintenance cost. Another method called life cycle method is used for calculating the savings throughout the lifetime of the solar drier. Life cycle method is used for determining savings per day, present worth of annual savings and present worth of cumulative savings. The cost of drying per kilogram of dried product was evaluated. The savings per batch and savings per year were also evaluated using this method of analysis. The annual savings for drying pineapple in the 20th year was also calculated. Cumulative savings is the summation of the annual savings. The last method is payback period, which is the period required to retrieve the investment. The payback period should be necessarily short comparing to the life span of the drier. This is because people come forward to buy the equipment if they get back their investment soon. The following equation was used for finding out payback period.

$$\text{Payback period, } N = \frac{\ln\left(1 - \frac{C_{cc}}{S_1}(d - i)\right)}{\ln\left(\frac{1+i}{1+d}\right)} \quad (4)$$

Results and Discussion

Test of the drier without load : To evaluate the performance of the solar drier, it was tested under unloaded condition. The experiment was performed for 8 hours from 9:00 AM to 5:00 PM. The temperature sensors were placed in appropriate places to monitor the temperature. The temperature of glazing, wire mesh absorber, bottom plate, inlet air, and outlet air of the solar air heater and the inlet temperature, tray temperature, hot air temperature and outlet temperature of the drier were also monitored for every ten minutes. The test was repeated for 4 sunny days for accurate results. Intensity of solar radiation corresponding to each temperature was recorded.

Temperature profile with solar radiation intensity is depicted in Fig. 2. Wire mesh absorber recorded a maximum temperature of 91 °C at 1:00 PM during the study. The solar intensity corresponding to maximum temperature was 797 W/m². The maximum temperature achieved by the glass plate was 53 °C and the maximum hot air temperature was 70 °C. The ambient temperature varied from 29 °C to 34 °C during the study. Other designs in the literature reported maximum tempera-

ture difference to be 27 °C for single pass, 38 °C for double pass (Aldabbagh et al., 2010), and 40 °C when fins were used in between mesh layers (El-khawajah et al., 2011).

Test of the drier with load : A detailed performance evaluation was undertaken on the system with product loaded in the drying chamber. The developed drier was basically intended for drying agricultural and marine products. The experiment was conducted with fresh Tomatoes loaded in the dryer. Tomato (*Solanum lycopersicum*), belongs to the family Solanaceae is an edible red fruit consumed throughout the world. The fruit is native to Western South America and Central America and one of the most important food crops of India. Tomato is rich in Vitamin A, C, Potassium, Minerals and fibers. Tomatoes are used in the preparation of soup, salad, pickles, ketchup, puree, and sauces and also consumed as a vegetable in many ways. Drying is one of the ways to make full use of its flavor (Ponkham, Meeso, Soponronnarit, & Siriamornpun, 2012). Dried tomatoes are best ingredients when the season for fresh tomatoes goes. Fresh tomatoes were loaded in the drier for testing. The fruit was cut into 6 mm and 4 mm slices for drying experiment. The product was dried without any pretreatment. The initial moisture content of the product was evaluated by keeping the product in hot air oven at 110 °C for 24 hours. The weight of the product loaded in the dryer was recorded for every one hour. The initial moisture content of the tomato at 9:00 AM was 90.62 %. The moisture content was calculated for every one hour and the percentage reduction in moisture content was estimated. The maximum temperature inside the drying chamber was recorded to be 56.8°C at 12:20 PM. The corresponding solar radiation intensity was 856.3 W/m² and the average solar intensity of the day was 638.05 W/m². The maximum temperature attained by the transparent cover was 50.7 °C as shown in Fig. 3.

The United Nations Economic Commission for Europe (Nations, 2007) worked on quality standard of dried tomatoes and reported that the texture varies depending on the moisture content. The texture of the tomato is soft and pliable when the moisture content is between 25% and 50%. When moisture is between 18% and 25% it is firm and pliable. 12 percent of minimum moisture gives very firm tomatoes and that of 6% gives hard and brittle tomatoes. Fresh tomato having an initial moisture content of 90.62% got reduced to 18.28 % in three hours. The texture was hard and brittle when the moisture content was brought down nearly to 6%. The drying process was faster in solar drier compared to open sun as shown in Fig. 4. The observed advantages of solar drying over open sun drying are the product was free from fungal and bacterial infections and the loss during drying process was zero with the added advantage of considerable reduction in drying time. The original color and odor of the tomato was preserved. As described in the above section, a detailed economic analysis was performed to determine the suitability of the developed model for commercial application. For calculating the annualized cost of the drier, the capital cost of solar and electric drier are taken to be Rs.1, 40,000.00 and Rs. 1,00,000.00 respectively. The annual maintenance cost was taken to be 10% of the annual capital cost. The salvage value was assumed to be 10% and rate of interest as 8%. The fuel

cost of solar drier is zero and the running cost of blower was taken into account. The efficiency of electric drier was assumed to be 80%. The dried quantity of tomato removed from the solar dryer was 351 kg per year. The unit cost of electricity was taken to be Rs. 4.00. The annualized cost of solar and electric driers worked out to be Rs. 17,254.00 and Rs. 12,173.00 respectively. In life cycle savings analysis, savings per day, present worth of annual savings and present worth of cumulative savings were calculated. The inflation rate was taken as 9 %. The calculation was done for first 20 years of operation and the savings can be extended over the lifetime of the drier. Table 1 shows the economic analysis performed on the developed system for 20 years. Payback period is the time required for the cumulative fuel savings becomes equal to the total initial investment. Analysis showed that the total investment of Rs. 1,40,000.00 can be recovered in two years of operation. The payback period of the solar drier was estimated to be 1.05 years (263 solar days) which is very small compared to the lifetime of the drier. Thus the drier can be operated at low maintenance cost throughout its lifetime.

Conclusion : Performance of the developed matrix air heater in drying application was evaluated and established. The dryer proved efficient and economic for drying fruits. Experiments were conducted with 4 mm tomato slices having an initial moisture content of 90.62 % took 3 hours to bring down to a safe moisture level of 18.28 %, which is propitious for storage. Economic analysis showed that the cumulative present worth of annual savings for drying tomatoes over the life of the dryer was Rs. 28, 52, 503.00. The capital investment of the dryer was Rs. 1, 40,000.00 and the payback period of the dryer was calculated to be 1.05 years which is very short comparing the life time of the dryer.

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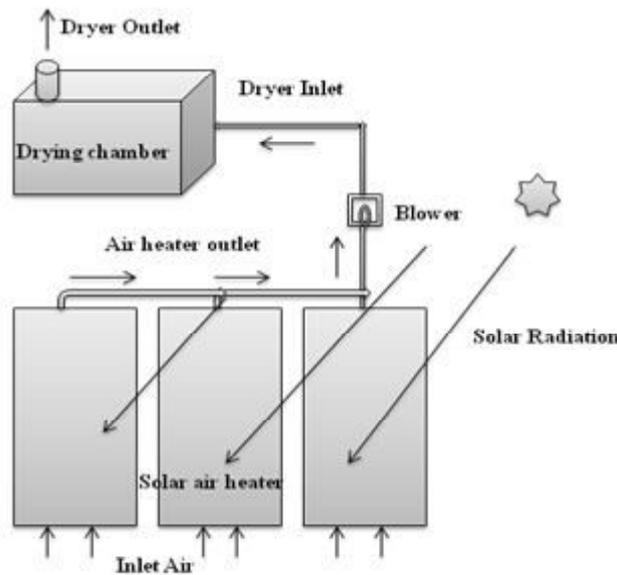
Table 1

Economics of the solar dryer-annual saving, present worth of annual saving and present worth of cumulative annual saving for each year during the life of the solar dryer for drying Tomato

Year	Annualized cost of dryer (Rs.)	Annual Savings (Rs.)	Present worth of annual saving (Rs.)	Present worth of cumulative saving (Rs.)
1	17,254.00	1,41,000.00	1,30,555.00	1,29,000.00
2	17,254.00	1,53,690.00	1,31,764.00	2,60,764.00
3	17,254.00	1,67,522.00	1,32,984.00	3,93,748.00
4	17,254.00	1,82,599.00	1,34,215.00	5,27,963.00
5	17,254.00	1,99,033.00	1,35,458.00	6,63,421.00
6	17,254.00	2,16,945.00	1,36,712.00	8,00,133.00
7	17,254.00	2,36,471.00	1,37,978.00	9,38,111.00
8	17,254.00	2,57,753.00	1,39,256.00	10,77,367.00
9	17,254.00	2,80,951.00	1,40,545.00	12,17,912.00
10	17,254.00	3,16,236.00	1,41,846.00	13,59,758.00
11	17,254.00	3,33,798.00	1,43,160.00	15,02,918.00
12	17,254.00	3,63,840.00	1,44,485.00	16,47,403.00
13	17,254.00	3,96,585.00	1,45,823.00	17,93,226.00
14	17,254.00	4,32,278.00	1,47,173.00	19,40,399.00
15	17,254.00	4,71,183.00	1,48,536.00	20,88,935.00
16	17,254.00	5,13,590.00	1,49,912.00	22,38,847.00
17	17,254.00	5,59,813.00	1,51,300.00	23,90,147.00
18	17,254.00	6,10,196.00	1,52,701.00	25,42,848.00
19	17,254.00	6,65,113.00	1,54,114.00	26,96,962.00
20	17,254.00	7,24,974.00	1,55,541.00	28,52,503.00

Figure 1
 Designed solar drier a) Schematic representation b) Front view of collector
 c) Side view of collector

(a)



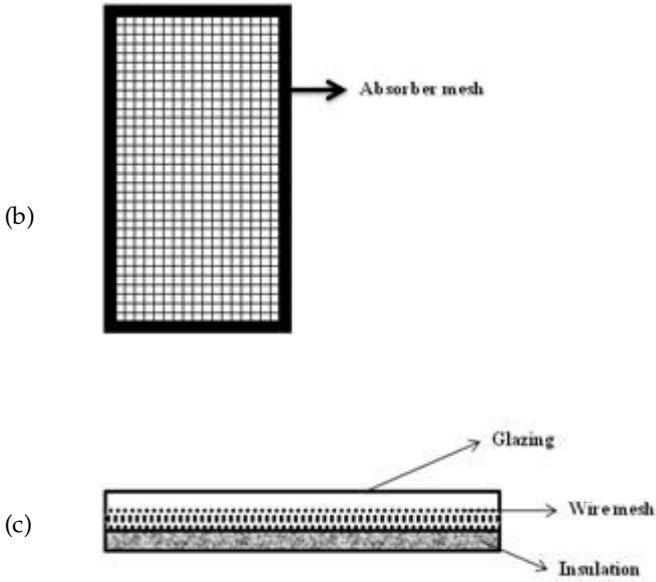


Figure 2
Temperature profile with solar radiation intensity under no load condition

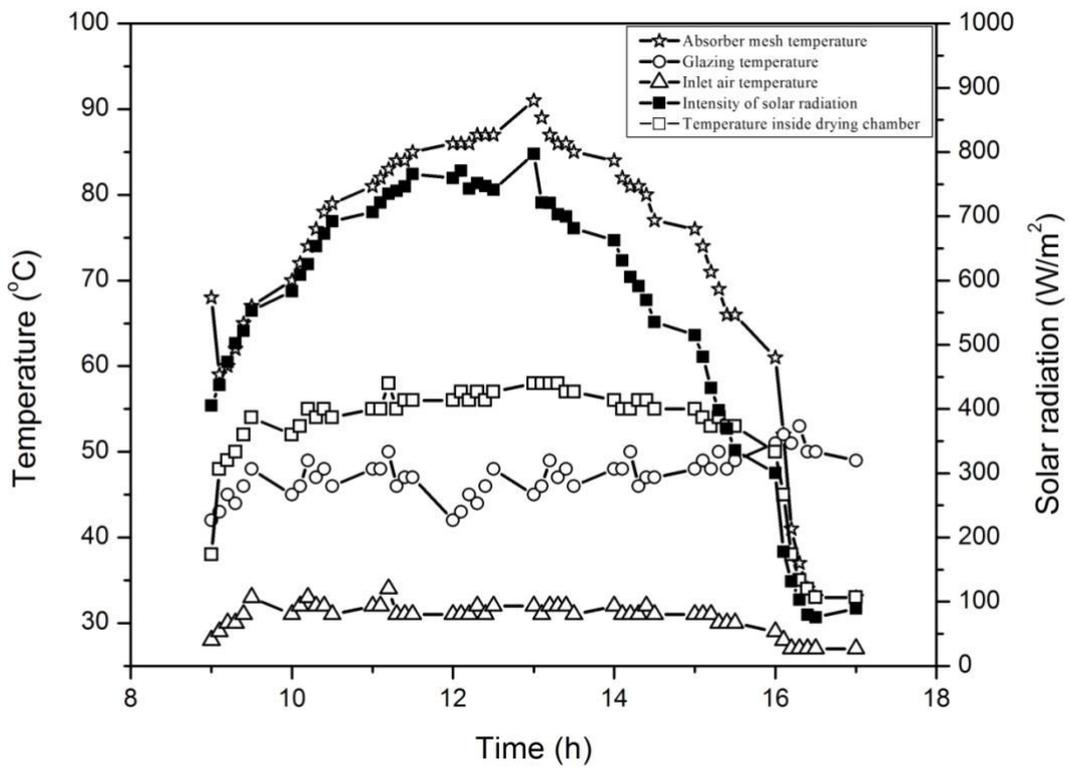


Figure 3
Temperature profile with solar radiation intensity under loaded condition

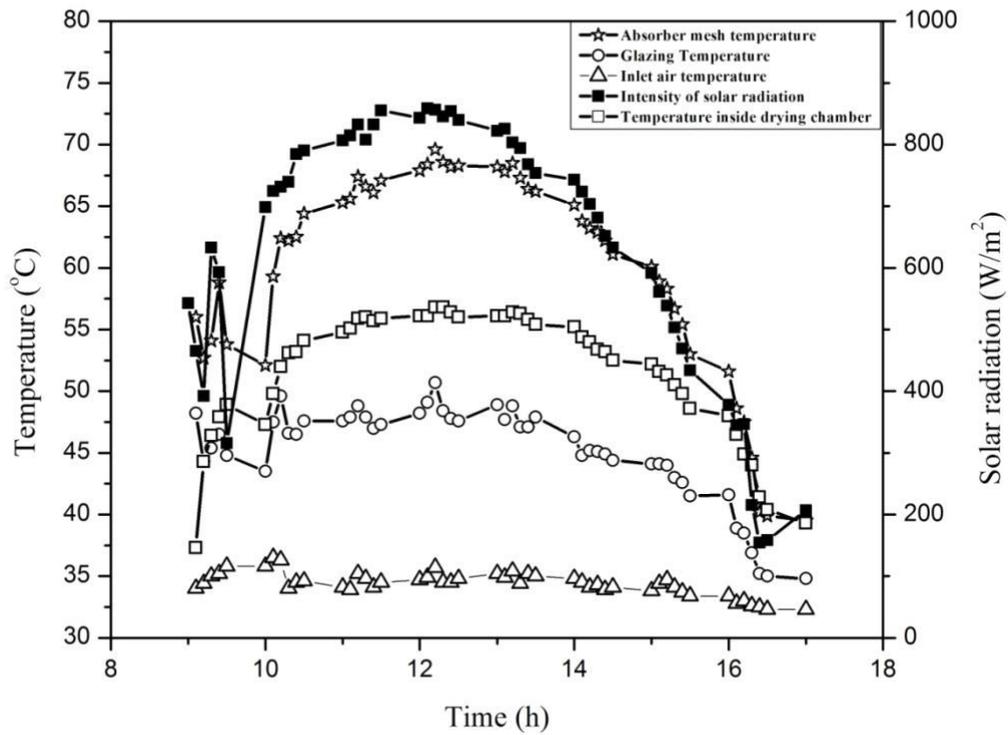
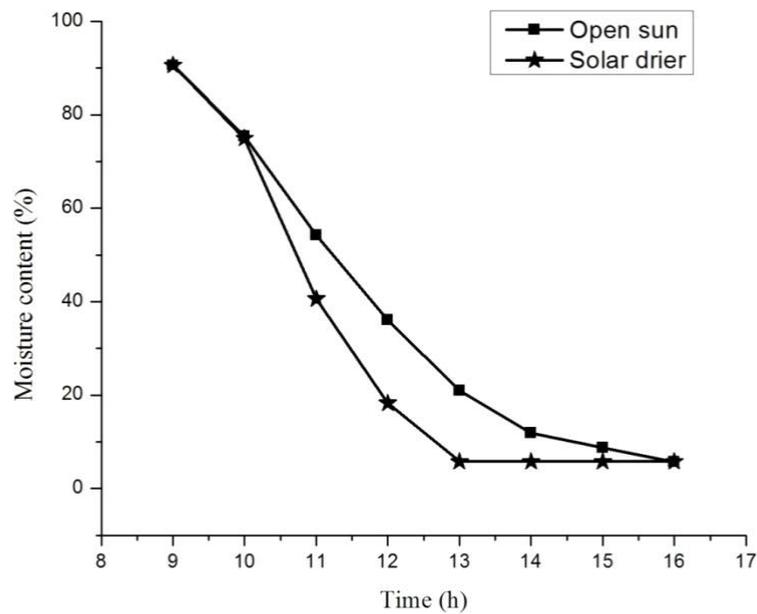


Figure 4
Percentage moisture content present in the sample with respect to time of day during drying process





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