

## **Analysis of Psychological Contract at the Workplace: A Cluster Analysis**

**D.S. Chaubey\***  
**S. P. Thapliyal\*\***  
**Sonal Bisht\*\*\***

### **Abstract**

The present research work aims at analyzing the psychological contract between employer and employees and classifying the different employees as per their preference towards various psychological contracts. Psychological contract is based on employees and employers mutual trust and relationship and obligation to each other. The study indicates that perceptions of mutual trust, mutual understanding and perceived reciprocity form the strong psychological contract. The research finding using factor analysis reveals five important factors building psychological contract among employees and employers. These are named as Relational contract, Employer obligations like providing safety, security and overall good working environment. Transactional relationship which is the combination of variable like financial and economic benefit offered by the organisation in view of their services offered to the organisation, employees obligation which is the combination of variable like employees involvement, his commitment and enthusiasm towards the organisation and Internal advancement in which the employees see the future benefit for the good job done in the organisation. Analysis also indicates that female employees were rated higher and given more weightage to the factors of psychological contract than male respondents. Cluster analysis depicts that majority of the employees in the sample are of the opinion that relational contract building mechanism is the main strategy for the organisation to build strong psychological contract among employees.

**Keywords :** Psychological Contract, Relational Contract, Transactional Relationship, Employees Obligation, Internal Advancement

### **Introduction**

Over the last few decades the Psychological contract research gained significant importance among researchers and academicians. Psychological contract has been considered as an important concept for understanding employees' relationships with their employers and its successive consequences including work attitudes and performance. The psychological contract is generally defined in the academic literature as the implicit and explicit promises two parties make to one another (Rousseau & Tijoriwala, 1998). The knowledge of Psychological contracts and its various components are vital for managers to understand, manage and work to avoid adverse consequences.

The psychological contract refers to an individual employee's belief in mutual obligations between them and their employer. Psychological contracts are a key management concern, as they can impact employees' attitudes and behaviors in ways that influence organizational efficiency and effectiveness. Traditionally, it was believed that the main expectation of employees in return for their input to the company was a level of employment stability both in terms of working environment and job security (Sparrow and Marchington, 1998; Martin, Staines and Pate, 1998; Beardwell et. al. 2004). However, the rapid changes in the economic and business life the last decades transformed significantly organizations.

---

\* Dean, Research and Studies, Uttaranchal University, Dehradun. E-mail: chaubeyds@gmail.com

\*\* Research Scholar, Sainath University, Ranchi, Jharkhand. Email: sphapliyal@hotmail.com

\*\*\*Research Scholar, Pacific University, Udaipur, Rajasthan. Email: soniz1@rediffmail.com

Intense competition on a global scale, political developments and numerous other factors forced organizations to adapt its structure towards a leaner, flexible more efficient approach that could withstand competitive pressures (Hiltrop, 1995). As a consequence, there was a restructuring on people management and corresponding changes in the employment relationship.

Human resources are considered as most important valuable resource for any company. To manage these resources, organizations require a Human Resource Management (HRM) that provides the adequate work force within the new global economy. Managing psychological contract includes solid agreements between company and its employees, beyond the written contract, specifying their contributions, expectations, beliefs, promises, and obligations between both parties. Concerning the 'new' workplace there have been indeed being changes in the employment relationship, mainly attributed to global movements in economies and labour markets. The most interesting point in this theoretical framework is the recognition of the Psychological Contract as a tool in the manager's efforts to handle the employment relationship. Substantiating that, Guest & Conway (2002) reported findings from a survey of 1,306 senior HR showing that the psychological contract offers managers a framework within which to contemplate and administer the ER (employment relationship). With these important factors into consideration, it is important to classify the various components of Psychological contract so as to manage it according to employee's choice and expectations. The present paper focuses on classifying the Psychological contract on the basis of rating given by the employees working in some select service organisation of Dehradun on different variables of psychological contract using cluster analysis.

### **Review of Literature**

Several studies have examined the contents of the psychological contract which can be considered as the basic terms of the conceptual agreement. Theory in this area provides a theoretical foundation for the psychological contract concept which is examined in the Systematic Review. In terms of the employee-centred view of the psychological contract, one of the most comprehensive studies of contents was that of Herriot et. al. (1997) which examined perceptions of both employer and employee expectations. The twelve employer obligations identified were training, fairness, recognition of employee's personal needs, consultation, discretion with regards to managerial action, humanity, recognition, creating a safe working environment, justice, pay, benefits and job security. Employee obligations fell into seven main categories which were working contractual hours, doing a good job, being honest, being loyal, respecting company property, maintaining self-presentation and being flexible. This list was particularly strong giving the collection of both employee/employer obligations, the good sample size and the clarity in the categories observed. The psychological contract deals with commitments made by both parties starting with the formal employment contract. In contrast to the formal, often written agreement based on labour market laws, regulations and collective agreements, the psychological contract consists of the subjective perceptions held by both employer and employee of the formal and informal entitlements and obligations between them. These perceptions are dynamic and highly sensitive and susceptible to change in times of organizational restructuring. Apart from the content, researchers have also investigated the basis for the psychological contract in terms of mutual trust and justice.

"Cultural values" represent, according to Schwartz (1999), "implicitly or explicitly shared abstract ideas about what is good, right, and desirable in a society" (p. 25). Cultural values "are the bases for the specific norms that tell people what is appropriate in various situations" (p. 25). "The explicit and implicit value emphases that characterise a culture are imparted to societal members through everyday exposure to customs, laws, norms, scripts, and organisational practices that are shaped by and express the prevailing cultural values" (p. 25). Markus and Kitayama (2003) stressed the cultural shaping of psychological processes. The societal cultural values are reflected and promoted by customs, norms, practices and institutions. These become lived experiences in "local" worlds (e.g. the workplace) and

result in a set of habitual psychological tendencies (ways of thinking, feeling, and acting). The psychological contract can be seen as a specific work-related experience where employee and employer live out their core cultural values.

The employment relationship is based on an exchange: the employer offers certain returns (e.g., pay, benefits, employment security) in exchange for employee contributions (e.g., effort, commitment, productivity) and the level of exchange depends on expectations from both sides. In this way, psychological contract can be defined as a set of beliefs, evaluations and assumptions held by employees about their employment relationships (Rousseau, 1995).

Psychological contracts serve as a filter through which the information about the employment relationship is processed, thus guiding employee attitudes and behaviors. There are many elements that shape employees' psychological contracts. Thus far, a few variables pertaining to the individual have been identified as having an impact on the psychological contract including career motivations (Larwood et. al., 1998), previous work experiences (Cavanaugh and Noe, 1999), and availability of job alternatives (Turnley and Feldman, 1999). With regard to company policies and actions psychological contracts are shaped by both economic (e.g., pay and benefits) and non-economic (e.g., support, participation in decision making) returns offered by the organization (Rousseau and Geller, 1995).

Beck (2000) classify the worker into fixed-term and temporary contracts that might plausibly be associated with higher job insecurity, a sense of marginalization and loss of opportunity for development, for career and for organizational identification. Accordingly he described the growth of such contracts as shifting the risk from the employing organization to the individual.

Zagenczyk, et. al. (2015) studied the Psychological Contracts as a Mediator Between Machiavellianism and Employee Citizenship and Deviant Behaviors. Research contributes to scholars' understanding of the theoretical underpinnings of the relationship between Machiavellianism and contextual performance as well as to the psychological contracts literature by demonstrating that Machiavellianism influences contextual performance because it affects the manner in which employees construe their employment relationships.

Shapiro and Kessler (2002) in their study explores the consequences of contingent work arrangements on the attitudes and behaviour of employees using the psychological contract as a framework for analysis. results suggest that contract status plays an important role in how individuals view the exchange relationship with their employer and how they respond to the inducements received from that relationship.

Robinson, Kraatz and Rousseau (1998), in their study on Changing Obligations and the Psychological Contract: A Longitudinal Study investigated changes in employment obligations as perceived by employees. The study revealed that during the first two years of employment, employees came to perceive that they owed less to their employers while seeing their employers as owing them more. An employer's failure to fulfill its commitments was found to be significantly associated with decline in some types of employee obligations.

Generally, two types of psychological contracts have been distinguished: transactional and relational. Whereas transactional contracts are focused on economic returns, closed-ended, and static, relational contracts are primarily socio-emotionally focused (non-economic returns), open-ended, and dynamic (Rousseau and Parks, 1992; Shore and Tetrick, 1994). In transactional contracts both parties aim at maximizing their own gains, while in relational contracts the aim is to maximize current and future outcomes for both parties (employees and employers). Relational contracts are more complex and they entail a variety of economic and psychosocial returns (i.e., beside pay and benefits also organizational support and loyalty to the employees are important factors), burdens and benefits are shared among the parties and balanced over time. Also, relational contracts are considerably less explicit than transactional ones, as they are based on assumptions and many provisions of the contract are not clearly specified.

There are some important characteristics about the Psychological Contract that are highlighted in the contemporary literature, such as its subjective nature, its definition as part of the employees and employers expectations. In addition there are debates over the 'old' and 'new' types of employment relationship. However, most of the literature focuses on relatively large firms with a set number of managers and workforce. Examining the literature on smaller firms, there is a lack of significant focus on the topic of the psychological contract and generally on the development of human resources management. This may be due to the complexities associated with structure and the strong influence of the proprietor/manager model. In spite of the lack of a combined approach to reconcile the concept of the Psychological Contract and small firms, the abundance of research on the former provides a substantial qualitative basis for investigating these two themes. Essentially, there is significant room to try and test the hypotheses of the various schools of thought on the psychological contract on some small firms' setting. Of course there certain constraints that must be taken into account before engaging in such an examination. As the review of the small firms theory suggests, there are numerous complexities among different settings of small businesses varying from market to market and country to country.

### **Statement of Problem**

The knowledge about the psychological contract measures and theory adequately capture the reality of employee's psychological contract experiences. In order to draw meaningful conclusions, the researchers need some degree of confidence that their measures represent psychological contract theory and employees' experiences. The methodology that is most appropriate to examine the underlying nature of the employer-employee relationship, as employees perceive it, is qualitative. There is very little qualitative research in the field of psychological . The qualitative research that is available has been criticized for being conducted in only one organization and often only examining the content of the psychological contract (as opposed to its nature or the general relationship, Conway & Briner, 2005; Roehling, 1997). As noted earlier, there has been an increasing interest in the field to take a step back in the literature and consider its more rudimentary and theoretical issues

### **Objective of the Study**

Increased workplace competition from many directions is continuously changing the employee and employer perceptions about performance expectations, pay, working hours and everything in between. Today every employees have different expectations and career motivations altogether. This has made management task more challenging in finding ways to stay credible and trustworthy in an environment where promises may be seen as empty. The present research work is aimed with the following objectives:

- a. To identify the different psychological contract and their role in understanding contemporary employment relationship
- b. To classify the employees according to their perception towards psychological contract using cluster analysis

### **Methodology**

The present research is based on descriptive research using survey method. The population for this study was employees of different profiles (workers, supervisors and managers) working in service organisations of Dehradun, the state capital of Uttarakhand. The survey was based on the visit to organisations for interaction with randomly chosen staff members with judgmental sampling. As a result, 113 working professionals of well-known service organisations were identified and the survey instrument was distributed to them. A structured questionnaire was designed covering various dimension of psychological contract. The questionnaire included over 40 items that were related to the attitude of employees towards various dimensions of Psychological contract. Questionnaire was divided into

two parts (Part A and B). Part A deals with demographical and professional characteristics of employees such as age, gender, present position in the institution, educational qualification, years of experience. Part B consists of various statements regarding attitude of employees towards psychological contract in five-point Likert scale, where 5 represents strongly agree and 1 represents strongly disagree. Pilot study was further carried out to ensure reliability and validity of the instrument and data to be collected. In order to ensure validity, the initial questionnaire was given to a group of referees (a panel of expert) to judge its validity according to its contents, clarity of items meaning, suitability to avoid any misunderstanding and to assure its linkage with main study objectives. In order to validate the reliability, questionnaire was pilot tested using 15 employees of different cadre, representing 13% of the total sample size, who were considered the representative of the study population. Value of Cronbach's alpha was found to be 0.957 indicating acceptable level of reliability of research instrument. Data thus received was systematically arranged, tabulated and analyzed. Analysis of data was performed using IBM SPSS version 20. Table 1 depicts the demographic characteristics of the respondents.

Table 1: Characteristics of Respondents

	Categories	Count	Percentage
Age	Less than 25 Years	39	34.5
	25-35 Years	59	52.2
	35-45 Years	12	10.6
	45 to 55 Years	3	2.7
Gender	Male	79	69.9
	Female	34	30.1
Marital Status	Married	45	39.8
	Unmarried	68	60.2
Family Size	Upto 2 members	11	9.7
	3 to 4 members	49	43.4
	5 to 6 members	41	36.3
	More than 6 members	12	10.6
Education Level	Upto Matric	3	2.7
	Upto Intermediate	11	9.7
	Upto graduation	69	61.1
	Post Graduate	20	17.7
	Post Graduation with other specialisation	10	8.8
Income Level	Upto Rs.15,000 PM	66	58.4
	Rs.15,001 to Rs. 30,000 PM	35	31.0
	Rs. 30,001-Rs. 45,000 PM	8	7.0
	Rs. 45,001 to Rs. 60,000 PM	2	1.8
	Rs. 60001 to Rs.100000 PM	2	1.8
Professional Experience	Less than 1 year	18	15.9
	1 to 3 years	55	48.7
	3 to 5 years	9	8.0
	5 to 10 years	30	26.5
	More than 10 years	1	0.9

Source : Primary survey

Data summarized in Table 1 indicate demographical and professional characteristics of sample respondents. 34.5% respondents were from age group upto 25 years, 52.2 % were from 25-35 years and 11.3 % were from age group of 41 – 50 years. 10.6% respondents found in the age group of 35-45 years

and remaining were between 45-55 years of their age. Out of 113 respondents, 69.9% were male whereas 30.1% were female. Survey projects that majority of the respondents from the unmarried category. According to educational qualifications, almost 61% were graduates, 17% were post-graduates and 8.8% respondents were having post graduation with other professional degree. The survey reveals that majority of them are having average family size upto 4 members and drawing monthly income upto Rs.30000 per month. The survey reveals that 15.9% ,48.7%, 8.0% 26.5% and 0.932 % respondent were having work experience upto 1 year, 1 to 3 years, 3 to 5 years, 5 to 10 years and More than 10 years respectively. This shows that representative sample covers responses of diverse demographical and professional characteristics, so that perception towards pshychological contract can be evaluated effectively across the different dimensions.

### **Analysis and Discussion**

Understanding employee perception and their behaviour in building psychological contract with organisation and various factors affecting their long term relationship has been of a major interest for the researcher and organisation as whole. Psychological contract based on employees and employers mutual trust and relationship and obligation with each other. The important variable of psychological contract are also influenced by employees internal factors as well as exogenous factor. The empirical study indicates that perceptions of mutual trust, mutual understanding and perceived reciprocity form the strong psychological contract These components are viewed together since they are highly interdependent and together represent forces that influence employees to react to the object.

Keeping these into consideration, an attempt was made to assess the employees satisfaction, their expectation from the different relationship strategies influencing in favour of employees retention. For this respondents were asked to rate their views on the following statement such as My organisation promises to provide me with interesting and challenging work, My organisation promises to provide me with a reasonably safe and secure job and work environment, My organisation encourages employee for participation in the decision- making etc.. For this purpose, respondents were asked to rate the various statement on a scale of 1 to 5 in order of their preference. The exploratory factor analysis was used in order to identify the various customer relationship marketing and their retention strategies. reliability analysis of all the factor was carried out with the help of SPSS using Cronbach's Alpha test. The value of Cronbach's Alpha of all the factors was found to be 0.957 which indicates that factor analysis can be applied on the variable. Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure are adopted to determine the appropriateness of data set for factor analysis. High value (between 0.5 to 1) of KMO indicates that the factor analysis is appropriate, low value below the 0.5 implies that factor analysis may not be appropriate. In this study, the result of Bartlett's test of sphericity (0.00) and KMO (0.744) indicate that the data are appropriate for factor analysis. Principal Component analysis was employed for extracting factors and orthogonal rotation with Varimax was applied. As latent root criterion was used for extraction of factors, only the factors having latent roots or Eigen values greater than one were considered significant; all other factors with latent roots less than one were considered insignificant and disregarded. The extracted factors along with their Eigen values are shown in table 2. The factors have been given appropriate names on the basis of variables represented in each case. The names of the factors, the statements, the labels and factor loading have been summarized in Tables 2. There are five factors each having Eigen value exceeding one for motivational factors. Eigen values for five factors are 16.844, 3.313, 2.73, 1.784 and 1.665 respectively. The index for the present solution accounts for 65.84% of the total variations for the psychological contract factors. It is a pretty good extraction because we are able to economise on the number of choice factors (from 40 to 5 underlying factors), we lost 34.16% of information content for choice of variables. The percentages of variance explained by factors one to five 42.11, 8.28, 6.82, 4.46, and 4.0 respectively. Large communalities



indicate that a large number of variance has been accounted for by the factor solutions. Varimax rotated factor analysis results for motivational factors are shown in Table 2 which indicates that after 5 factors are extracted and retained the communality is 0.901, for variable 1, 0.753 for variable 2, 0.787 for variable 3 and so on. It means that approximately 90% of the variance of variable 1 is being captured by extracted factors together. The proportion of the variance in any one of the original variable which is being captured by the extracted factors is known as communality (Nargundkar, 2002).

Table 2. Principle Components and Associated Variable Using Factor Analysis

	Relational contract	Employer obligation	Transactional Relationship	Employees Obligation	Internal advancement	Communalities
I always promise to volunteer to do tasks outside my job requirements?	0.827					0.901
I promise to meet the performance expectations in my job?	0.811					0.753
I always promise to assist others for their work	0.789					0.787
I commit to be a good team player	0.787					0.799
I promise to develop new skills and improve my current skills	0.785					0.828
I promise to show loyalty to my Organisation.	0.749					0.850
I promise to provide the organisation with innovative suggestions for improvement	0.722					0.799
I am committed to develop my skills to be able to perform well in this job.	0.713					0.817
I promise myself to protect my company's image	0.697					0.746
I promise to respect the rules and regulations of the company?	0.688					0.837
I always promise to turn up for work on time.	0.685					0.837
I promise to be polite to customers or the public when they are being rude and unpleasant to me	0.682					0.754
I feel proud to be a part of the organization	0.678					0.716
I promise to work overtime or extra hours whenever required	0.654					0.773
This organization provides better career development opportunity and my career path in the organization is clearly mapped out	0.567					0.738
I am highly involved in my place of work to achieve the purely short term goals of my job	0.457					0.787
My organisation promises to provide me with a reasonably safe and secure job and work environment		0.776				0.825
My organisation promises to provide violence and harassment free environment.		0.750				0.828
Present organisation ensures its employee fair treatment by managers and supervisors and provide a good working environment.		0.726				0.848
My organisation encourages employee for participation in the decision- making.		0.716				0.753
My organisation promises to provide me with interesting and challenging work		0.661				0.765
This organisation promises to provide possibilities to work						

together in a pleasant way?	0.651				0.771
My organisation promises to improve my future prospects?	0.632				0.679
I feel as a part of the team in this organization	0.597				0.790
This organisation helps its employees to deal with problems encountered outside work.	0.559				0.690
I feel this organization reciprocates the effort put in by its employees	0.394				0.661
I do this job just for the money	0.862				0.854
my organization promises to provide me with good pay for the job I perform.	0.798				0.872
I am loyal to my organisation and don't intent to leave this organisation in future	0.756				0.780
I have a reasonable chance of promotion if I work hard for this organization	0.586				0.693
I prefer to work in a strictly defined set of working hours	0.826				0.813
I expect to gain promotion in this company with length of service and effort to achieve goals	0.593				0.831
I only do what is barely required to get my job done	0.725				0.767
It is important to get too involved in your job	0.627				0.797
I promise to accept an internal transfer if required?	0.554				0.753
I commit myself to go to work even if I do not feel particularly well?	0.837				0.801
I promise to work enthusiastically on jobs which others would prefer not to do.	0.532				0.754
I always try to seek job assignments that would enhance my role				0.826	0.785
I always tries to increase my participation in the decision making				0.792	0.705
Total	16.844	3.313	2.73	1.784	1.665
% of Variance	42.11	8.282	6.824	4.46	4.164
Cumulative %	42.11	50.393	57.217	61.677	65.84

Principal components and associated variables indicates that first factor (Relational contract) indicating the employees preference towards building relational contact strategies by the organisation. The second factor of Psychological contract was found to be Employer obligations like providing safety, security and overall good working environment. The third factor emerged as transactional relationship which is the combination of variables like financial and economic benefits offered by the organisation in lieu of their services offered to the organisation. Fourth factor emerged as employees obligation which is the combination of variables like employees involvement, his commitment and enthusiasm towards the organisation. Fifth factor emerged out as Internal advancement in which the employees see the future benefit for the good job done in the organisation. It is clear from the above that a combination of all these factors leads to better working environment and strong psychological contract between employer and employees.



Table 3. Mean of Different Psychological contract across the gender category of respondents (Group Statistics)

	Gender wise classification of respondents	N	Mean	Std. Deviation	(Group Statistics)	
					Std. Error Mean	
Relational Contract	Male	79	4.1369	0.67166	0.07557	
	Female	34	4.3162	0.39407	0.06758	
Employer Obligation	Male	79	3.9156	0.68913	0.07753	
	Female	34	3.7712	0.65873	0.11297	
Transactional Relationship	Male	79	3.6108	0.61237	0.06890	
	Female	34	3.5882	0.59155	0.10145	
Employee Obligation	Male	79	3.8861	0.67686	0.07615	
	Female	34	3.9765	0.48932	0.08392	
Internal Advancement	Male	79	3.9684	0.81391	0.09157	
	Female	34	4.1471	0.57114	0.09795	

The independent-samples t-test compares the means between two unrelated groups on the same continuous, dependent variable. In the above table, we see the group statistics by calculating the mean, standard deviation (SD) and variance of different factors of psychological contract across the gender category of the respondents. In the Group Statistics box, we observe that mean of the relational contract rated by female respondents (4.316269) are higher than the mean rated by male candidate (4.1369). Similar is the result in case of Employee Obligation and Internal Advancement. However it is seen that male has rated higher in case of Employer Obligation and Transactional Relationship. Looking at standard deviation, we see that male response is more inconsistent than the female respondents.

Table 4. Independent Samples T Test

	Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	df	Sig.	Mean Difference (2-tailed)	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Relational contract	Equal variances assumed	0.552	0.459	-1.451	111	0.150	-0.17931	0.12361	-0.42425	0.06563
	Equal variances not assumed			-1.769	100.583	0.080	-0.17931	0.10138	-0.38043	0.02181
Employr obligation	Equal variances assumed	0.195	0.660	1.035	111	0.303	0.14437	0.13952	-0.13210	0.42084
	Equal variances not assumed			1.054	65.281	0.296	0.14437	0.13702	-0.12925	0.41799
Transactional Relationship	Equal variances assumed	0.732	0.394	0.181	111	0.857	.02252	0.12435	-0.22388	0.26893
	Equal variances not assumed			0.184	64.642	0.855	.02252	0.12263	-0.22242	0.26747
Employee Obligation	Equal variances assumed	0.290	0.591	-0.703	111	0.484	-0.09039	0.12860	-0.34523	0.16444
	Equal variances not assumed			-0.798	85.267	0.427	-0.09039	0.11332	-0.31569	0.13490
Internal Advancement	Equal variances assumed	2.824	0.096	-1.162	111	0.248	-0.17870	0.15383	-0.48353	0.12612
	Equal variances not assumed			-1.333	87.586	0.186	-0.17870	0.13409	-0.44519	0.08779

Levene's Test for Equality of Variances was carried out to check if the two conditions have about the same or different amounts of variability between scores. A value greater than 0.05 means that the variability in your two conditions is about the same. That the scores in one condition do not vary too

much more than the scores in the second condition. Put scientifically, it means that the variability in the two conditions is not significantly different. This is a good thing. In the independent sample test the Sig. value is greater than 0.05. Hence it is inferred that in the mean of all the factors of psychological contract is not significantly different. The value of two tailed t test is 0.150. This value is greater than 0.05. Because of this, we can conclude that there is a statistically no significant difference between the mean factors of psychological contract for the male and female employees. Since the Group Statistics box revealed that the Mean for the female employees was greater than the Mean for the male employees, we can conclude that female employees were rated higher and given more weightage to the factors of psychological contract than male respondents.

### Classification of Employee's Psychological contract using Cluster Analysis

Cluster analysis or clustering is the task of grouping a set of objects in such a way that objects in the same group (called a cluster) are more similar (in some sense or another) to each other than to those in other groups (clusters). In other words cluster analysis is an exploratory data analysis tool which aims at sorting different objects into groups in a way that the degree of association between two objects is maximal if they belong to the same group and minimal otherwise. In other words, cluster analysis simply discovers structures in data without explaining why they exist. In the present research work, after identifying the factors of psychological contract, clustering is carried out with the aim to classify the respondents in each group.

Table 5 : Initial Cluster Centers Final Cluster Centers

	Cluster				
	1	2	3	4	5
Relational contract	3.98	1.00	4.46	4.08	2.06
Employer obligation	3.40	1.33	4.20	3.98	2.44
Transactional relationship	3.07	1.38	3.93	3.80	2.25
Employee obligation	3.45	1.20	4.25	4.04	1.60
Internal advancement	3.80	5.00	4.40	2.82	2.00

Table 6. Number of Cases in each Cluster

Cluster	1	2	3	4	5
	33	2	63	14	1
Valid	113				

A cluster analysis was run on five psychological contract factors shorted out of 40 variable each responding to different variable of psychological contract. A K-mean cluster analysis method produced five clusters, between which the variables were significantly different in the main. From the table it could be seen that cluster 1 has 33 employees. For them relational contract is the prime motive (3.98) followed by Internal advancement (3.80). the other three motives Employee obligation (3.45) Employer obligation (3.40) and Transactional relationship (3.07) are important as well. In cluster 2 there are 2 respondents. Their prime motives are Internal advancement (5.00) and transactional relationship (1.38). In cluster 3 there are 63 employees, for them the prime motive is Relational contract (4.46) followed by Internal advancement (4.40) Employee obligation (4.25) and Employer obligation (4.20). In cluster 4, there are 14 employees whose first choice is relational contract (4.084). Last cluster is of 01

respondents whose first choice is Employer obligation with mean (2.44) and followed by Transactional relationship (2.25).

### **Conclusion**

Understanding employee perception and their behaviour in building psychological contract with organisation and various factors affecting their long term relationship has been of a major interest for the researcher and organisation as whole. Psychological contract based on employees and employers mutual trust and relationship and obligation with each other. The important variables of psychological contract are also influenced by employee's internal factors as well as exogenous factor. The study indicates that the perceptions of mutual trust, mutual understanding and perceived reciprocity forms the strong psychological contract. These components are viewed together since they are highly interdependent and together represent forces that influence employees to react to the object. The research findings using factor analysis reveals five important factors building psychological contract among employees and employers. These are named as Relational contract, Employer obligations like providing safety, security and overall good working environment. Transactional relationship which is the combination of variables like financial and economic benefits offered by the organisation in lieu of their services offered to the organisation, employees obligation which is the combination of variables like employees involvement, his commitment and enthusiasm towards the organisation and Internal advancement in which the employees see the future benefit for the good job done in the organisation. It is clear from the above that a combination of all these factors lead to better working environment and strong psychological contract between employer and employees. Analysis also indicates that female employees were rated higher and given more weightage to the factors of psychological contract than male respondents. Cluster analysis depicts that majority of the employees in the sample are of the opinion that relational contract building mechanism is the main strategy for the organisation to build strong psychological contract among employees.

### **References**

- Beardwell I, Holden, L. and Claydon T. (2004) *Human Resource Management: A Contemporary Approach*, Essex: Prentice Hall
- Beck, U. (2000). *The Brave New World of Work*. Oxford: Blackwell.
- Guest E. D. and Conway N. (2002), 'Communicating the Psychological Contract: An Employer Perspective', *Human Resource Management Journal*, 12 (2), pp. 22-38.
- Herriot, P. M., Manning, W. E. and Kidd, J. M. (1997). 'The Content of the Psychological Contract', *British Journal of Management*, 8 (2), pp. 151-162
- Millward, J. and Hopkins, J. L. (1998), *Psychological Contracts, Organizational and Job Commitment*, *Journal of Applied Social Psychology*, Volume 28, Issue 16, pages 1530–1556.
- Shapiro J. and Kessler I., (2002) *Contingent and Non-Contingent Working in Local Government: Contrasting Psychological Contracts*, *Public Administration*, Volume 80, Issue 1, pages 77–101, Spring 2002 archived from <http://onlinelibrary.wiley.com/doi/10.1111/1467-9299.00295/abstract>
- Martin, G., Staines, H. and Pate, J., (1998) 'The New Psychological Contract: exploring the relationship between job security and career development', *Human Resource Management Journal*, 6 (3), pp. 20-40.
- Rousseau, D. M. (1995). *Psychological Contracts in organisations: Understanding Written and Unwritten Agreements*, Newbury Park, CA: Sage.
- Rousseau, D. M. & Tijoriwala, S. A. (1998). *Assessing psychological contracts: Issues, alternatives, and measures*. *Journal of Organizational Behavior*, 19, 679-695. Robinson, S., Kraatz, M and Rousseau,

D, in their study on Changing Obligations and the Psychological Contract: A Longitudinal Study archived from <http://amj.aom.org/content/37/1/137.short>

Schwartz, S. H. (1999). A theory of cultural values and some implications for work. *Applied Psychology: An International Review*, 48, 23-47.

Sparrow, P. and Marchington, M. (1998) *Human Resource Management: The New Agenda*, Harlow: Prentice Hall.

Zagenczyk, T., Restubog, S. L. D., Kiewitz, C., and Kiazad K. (2015), Psychological Contracts as a Mediator Between Machiavellianism and Employee Citizenship and Deviant Behaviors archived from <http://jom.sagepub.com/content/40/4/1098.abstract>

Zagenczyk, T., Restubog, S. L. D., Kiewitz, C., Kiazad, K., & Tang, R. L. (2011, in press) Psychological Contracts as a Mediator between Machiavellianism and Employee Citizenship and Deviant Behaviors. *Journal of Management*. doi: 10.1177/0149206311415420 (published online July 28, 2011)

## Horticulture for Improving the Economic Condition of Mizo Farmers: Problems and Prospects

Vanlalhumi\*  
L.S.Sharma\*\*

### Abstract

Horticulture, including fruits, vegetables, roots and tubers, spices, mushrooms, floriculture, medicinal and aromatic plants, nuts, and plantation crops, has emerged as an important sector. In India, the horticulture sector contributes about 28 percent of the gross domestic product (GDP) from about 13.08 percent of the total land area, and 37 percent of the total exports of agricultural commodities. As a result, the horticulture sector has received increased attention of the Government of India in respect of budget allocation, creation of research and development infrastructure, training of manpower and even marketing support. Mizoram being of hilly terrain, wet rice cultivation is not a feasible option for farmers. From the land capability statistics procured from Department of Horticulture of different districts of Mizoram, 55 percent of the total land of Mizoram is suitable for horticulture farming, but only a mere 10 percent of the total potential has been utilized. The required parameters like suitable climate, rainfall, temperature, soil, etc., presents an attractive prospect for cultivation of various horticultural crops ranging from tropical to sub-temperate crops in Mizoram.

Keywords: Horticulture, post-harvest management, production, sale and marketing, grapes, chayote, turmeric

### Introduction

Horticulture is the science or art of cultivating fruits, vegetables, flowers, or ornamental plants. Horticulture involves five areas of study. These are floriculture (includes production and marketing of floral crops), landscape horticulture (includes production, marketing and maintenance of landscaping plants), olericulture (includes production and marketing of vegetables), pomology (includes production and marketing of fruits) and postharvest physiology which involves maintaining quality and preventing spoilage of horticultural crops.

There are several advantages of growing horticultural crops. These crops produce higher biomass than field crops per unit area resulting in efficient utilization of natural resources, are highly remunerative for replacing subsistence farming and thus alleviate poverty level in rain fed, dry land, hilly, arid and coastal agro-ecosystems. Horticulture crops have potential for development of wastelands through planned strategies, require comparatively less water than food crops, provide higher employment opportunity, are important for nutritional security and are environment-friendly. Moreover, they are high-value crops with high potential of value-addition, have high potential for foreign exchange earnings, and make higher contribution to gross domestic product (GDP) from a limited land area under these crops.

The North-Eastern Region of India has been blessed with agro-climatic conditions pre-eminently suited for a variety of horticultural crops. It is the centre of origin of many horticultural species, has a wealth of orchid species and varieties and plenty of rare herbs. Mizoram is an expanse of blue-green hills situated at the southern extreme of North East India. It enjoys a splendid blend of climatic conditions of tropical, sub-tropical and temperate zone climates and the hill ranges run in North-South direction with varying altitudes with an average height of 920m above sea level, coupled with high mean annual rainfall of 2500 mm and high relative humidity up to 90 percent.

---

\*Asst. Professor, ICAFI University Mizoram, Aizawl. Email: mahumic@yahoo.co.in

\*\*Professor, Department of Management, Mizoram University, Aizawl. Email : lsksharma@yahoo.co.in

### **Literature Review**

According to Prasad and Kumar (2008), there is a great demand for horticulture produce in India as the majority of Indian population is vegetarian. However, India's share in global exports of horticulture produce is negligible being only one percent. But given the volume of world trade in fresh and processed horticulture products and the country's resources, India has the potential of more than doubling the present level of exports within the next five years.

Chadha (2006) says that India has favourable climates and soils for growing a larger number of horticultural crops. It was only in the mid-80's that the government identified horticulture sector as a means of diversification for making agriculture more profitable through efficient land use, optimum utilization of natural resources and creating skilled employment for rural masses especially the womenfolk. Horticulture has emerged as an integral part of food and nutritional security and an essential ingredient of economic security. Adoption of horticulture by farmers has brought prosperity in many regions of India. Sati (2004) has expressed that in economically backward regions where rural under-employment is a big problem, emphasis on horticulture can yield desired results in various directions. The adoption of horticulture also results in more efficient use of scarce land resource, maintains ecological balance by checking soil erosion, maintains soil moisture and results in better utilization of cultivable wasteland.

Chadha, Singh and Patel (2010), have commented on the growing competition in open economy, which demand competitive price of standard quality produce. Critical areas that need attention are low productivity and poor quality of product, inadequacy of infra-structural facilities for post-harvest management and marketing, inadequate efforts for product diversification and consumption, inadequacy of quality seed and planting material, inadequacy of human resource in horticulture, lack of appropriate database for effective planning, inadequacy of trained manpower and infrastructure in the states, poor delivery system, credit support and price support and slow pace in adoption of improved technology.

Peter (2009) has noted that with the economic developments taking place, agriculture is becoming more and more market oriented. Prices of horticultural products fluctuate widely from year to year, season to season, and even day to day. This variance makes horticultural production both profitable and very risky. Often, success depends on marketing skills and obtaining good prices rather than production expertise.

As Indian growers typically have a comparatively small quantity of produce with an average holding of less than a hectare of land, Chauhan (2004), suggested a system of "Pooling" of the produce or co-operative marketing under a common brand name. This would require guaranteed quality, uniformity in size and volume, good packaging and quality standards. To deal with unmarketable surplus of horticultural produce which is an integral part of the industry, he proposed semi-processing the produce in the growing areas itself to improve quality and provide employment in the countryside. Semi-finished produce can be then taken to a centralized facility for final conversion into a finished product.

### **Objectives of the Study**

The objectives of the study are:

- 1.To understand the potential for horticulture farming in Mizoram
- 2.To find out the socio-economic profile of horticulture farmers in Mizoram
- 3.To understand the reasons for adoption of horticulture farming
- 4.To examine the problems faced by horticulture farmers

### **Research methodology**

For the purpose of the study, three horticulture crops that have made significant gains in the recent past have been selected viz. grape (fruit crop), chayote (vegetable crop) and turmeric (spice crop). Data was collected with the help of a structured questionnaire which was successfully administered to 361 respondents, consisting of 113 turmeric farmers, 90 chayote farmers and 158 grape farmers. Interview



method was also used to collect data from the various cooperative society members and officials of Horticulture Department, government of Mizoram. Secondary data was collected from records maintained by the government of Mizoram, publications, books, etc.

## **Results and Discussion**

### **Viability of horticulture sector in Mizoram**

- Agriculture is the mainstay of the people of Mizoram. The economy of approximately 70 percent of the population in Mizoram is based on farming and majority of the farmers practice jhuming (shifting) cultivation. As there is very small area of flat land for practicing wet-rice cultivation (WRC), farmers of Mizoram have no alternative but to practice jhuming which is very detrimental from environment point of view besides being a fragile means of livelihood. To do away with this shifting method of farming, permanent farming in a cluster area with application of modern technology is an ideal approach for Mizo farmers.
  - Agriculture and allied sector contributes only 16.17 percent of Gross State Domestic Product (GSDP). In order to boost up the GSDP in Mizoram, high value crops with value addition and foreign exchange earnings need to be taken up which can only be fulfilled through horticultural crops so that the economic income of farmers can be enhanced manifold.
  - Human beings normally require 11 lakh calories per annum through the food they consume. This can be obtained from an area of 0.44 ha (4400 sq. m) of wheat while the same quantity can be obtained from an area of 0.03 ha (300 sq. m) of fruits like banana and 0.06 ha of mango. Thus horticultural crops like fruits can go a long way in reducing the pressure on food grains like wheat and rice which require extensive cultivation. In view of the limited area of land available for cultivation of food grains in Mizoram, cultivation of horticultural crops play a vital role in the prosperity of the state and is directly linked with health and nutrition of the people.
  - There are no mineral resources like iron ore, copper, oil, etc. available in Mizoram and so there is no prospect of setting up big industries and factories which are dependent on such minerals/resources. The only viable industry is agro-based industry especially food processing industry as the raw material can be easily obtained within the state. Hence, there is a vast scope for setting up of industries as well as production of various horticultural crops to boost the economy of the state and its people.
  - From the land capability statistics of different districts of Mizoram, it appears that 90.86 percent of the area i.e., 19,161.13 sq. km. accounts for potential horticulture area. However, taking into consideration the different slopes classe of Mizoram, slope percentage of 0-50 percent is presently considered as potential horticulture area. Thus the area for horticulture development can be estimated as 11.56 lakh hectares which accounts for 55 percent of the total land of Mizoram. Of the 11.56 lakh hectares potential cultivable land, 1.10 lakh hectares have been covered under plantation of various horticulture crops, which is a mere 10 percent of the total potential. There still exists a vast potential for developing the sector.
  - The required parameters like suitable climate, rainfall, temperature, soil, etc. present an attractive prospect for cultivation of various horticultural crops ranging from tropical to sub-temperate crops in Mizoram. The development of infrastructure like road communication, transport, market, etc. even in the remote areas pave the way for easy disposal of horticulture produce at a reasonable price. There is no unreached village and so suitable programmes can be taken up anywhere in the state.
- Socio-Economic Profile of Farmers

Table 1. Demographic Profile of the farmers

Characteristics	Turmeric	Chayote	Grape	Total	%
<b>1. Age</b>					
Young (below 35 years)	14	2	22	38	11%
Middle age (35 - 50 years)	40	30	59	129	36%
Old (above 50 years)	59	58	77	194	54%
<b>Total</b>	<b>113</b>	<b>90</b>	<b>158</b>	<b>361</b>	<b>100%</b>
<b>2. Education</b>					
Post graduate	0	0	4	4	1%
Graduate	2	9	20	31	9%
Matriculate	17	42	31	90	25%
Under-matriculate	79	39	65	183	51%
Literate	15	0	38	53	15%
Illiterate	0	0	0	0	0%
<b>Total</b>	<b>113</b>	<b>90</b>	<b>158</b>	<b>361</b>	<b>100%</b>
<b>3. Other occupations of farmers</b>					
Only farming	50	15	57	122	34%
Govt. service	12	13	39	64	18%
Own business	10	12	16	38	11%
Daily wage worker	13	8	9	30	8%
Privately employed	22	32	31	85	24%
Others	6	10	6	22	6%
<b>Total</b>	<b>113</b>	<b>90</b>	<b>158</b>	<b>361</b>	<b>100%</b>

Source : Primary data

Table 1 shows that 25 percent of respondents are matriculate and all respondents are literate. Many farmers engage in off-farm jobs to supplement their income. Some take up farming apart from their primary jobs as government servants also. 34 percent of the respondents depend only on farming for their livelihood. 18 percent of the respondents are government servants, 11 percent have their own businesses, 8 percent engage in daily wage work, and 24 percent are privately employed.

Table 2. Land holding pattern of horticulture farmers

Characteristics	Turmeric	Chayote	Grape	Total	%
<b>1. Area of land under cultivation</b>					
Less than 1 hectare	60	8	9	77	21%
1 - 2 hectares	50	82	114	246	68%
2 - 5 hectares	3	0	28	31	9%
More than 5 hectares	0	0	7	7	2%
<b>Total</b>	<b>113</b>	<b>90</b>	<b>158</b>	<b>361</b>	<b>100%</b>
<b>2. Type of land ownership</b>					
Owned by self	106	90	155	351	97%
Leased	6	0	0	6	2%
Provided by Govt.	0	0	0	0	0%
Owned by relative	1	0	3	4	1%
<b>Total</b>	<b>113</b>	<b>90</b>	<b>158</b>	<b>361</b>	<b>100%</b>

Source : Primary data

The above table reveals that nearly cent percent of the land is owned by the farmers themselves as indicated by the fact that 97 percent of the farmers surveyed have ownership of their farm land. Only 2 percent practice farming on leased land, while 1 percent practice farming on a relative's farm land. Table 2 exhibits that, of the total 361 horticulture farmers, 21 percent responded that they are cultivating their crop in less than one hectare of land area. 68 percent responded that the cultivated land is between 1-2 hectares, 9 percent are cultivating in 2-5 hectares of land area and 2 percent in more than 5 hectares of land area.

Table 3. Activities of horticulture farmers

Activity	Turmeric	Chayote	Grape	Total	%
Growing/farming	113	90	158	361	100%
Harvesting	113	90	142	345	96%
Processing	90	38	64	192	53%
Packaging	11	87	29	127	35%
Wholesaling/retailing	62	1	78	141	39%
Exporting	1	90	1	92	25%

Source : Primary data

In the context of Mizoram, we are still very ignorant of post-harvest management of horticultural produce. A vast majority of our farmers are engaged only in the primary activities of the trade, i.e., working the land, sowing and harvesting the produce. Out of the 361 horticulture farmers surveyed, 192 (53 percent) are engaged in processing their produce, 127 (35 percent) are engaged in packing, 141 (39 percent) are involved in wholesaling and retailing, and 90 (25 percent) are exporting their produce outside the state.

Table 4. Production of Select Horticulture Farmers

Criteria	Turmeric	Chayote	Grape	Total	%
1. Years of Horticulture Farming					
Less than 5 years	20	4	21	45	12%
5 - 10 years	89	13	102	204	57%
10 - 15 years	4	18	26	48	13%
15 - 20 years	0	23	8	31	9%
More than 20 years	0	32	1	33	9%
Total	113	90	158	361	100%
2. Annual Production (in quintals)					
Less than 10 qtls.	20	0	32	52	15%
10 - 50 qtls.	78	0	117	195	54%
50 - 100 qtls.	11	10	6	27	7%
100 - 200 qtls.	1	39	3	43	12%
More than 200 qtls.	3	41	0	44	12%
Total	113	90	158	361	100%

Source : Primary data

Increased production of crops enables a farmer to provide more food for his family, and also sell his surplus to sustain his livelihood. Increases in agricultural production lead to agricultural growth and can help to alleviate poverty in poor and developing countries, where agriculture often employs the greatest portion of the population. Increased production also encourages a farmer to invest more towards his trade and produce even more. It ensures food security as well as a way to sustain the well-being of a

community. Table 4 shows that among the 361 respondents surveyed, 15 percent said they produced less than 10 quintals per annum, 54 percent said 10-50 quintals per annum, 7 percent said 50-100 quintals per annum, 12 percent said 100-200 quintals per annum and 12 percent said they produced more than 200 quintals per annum.

### *Reasons for Adopting Horticulture farming*

Table 5. Reasons for adopting horticulture farming

Reason	Turmeric		Chayote		Grape		Total	
	%	rank	%	rank	%	rank	%	rank
Higher income opportunity	94.7%	1	91.1%	3	67.7%	1	82.0%	1
Shorter gestation period of crop	62.8%	3	93.3%	2	19.0%	6	51.2%	2
Higher yield per hectare	61.1%	4	54.4%	4	38.0%	2	49.3%	3
Success stories of other farmers	38.9%	7	54.4%	4	36.7%	3	41.8%	4
Ready market for sale of produce	71.7%	2	18.9%	6	29.1%	4	39.9%	5
Export opportunity	15.9%	9	98.9%	1	2.5%	8	30.7%	6
Requires low financial investment	53.1%	6	34.4%	5	5.7%	7	27.7%	7
Less labour intensive	56.6%	5	1.1%	7	6.3%	7	20.8%	8
Support from Govt.	26.5%	8	1.1%	7	24.7%	5	19.4%	9

Source : Primary data

An attempt was made to find out the reasons that led to the farmers in adopting horticulture farming. Several farmers have shifted from traditional farming (rice cultivation) to horticulture farming. Others have started horticulture farming without any prior farming experience. The government has taken effective steps in promoting horticulture sector in the state and encourage more farmers to adopt horticultural crops in the state. This has given a boost to the sector and the state has witnessed more and more farmers adopting horticultural crops. From table 5, we can infer that the foremost reason that led to the adoption of horticulture farming by the respondents is the opportunity for attaining higher income, followed by the shorter gestation period of the crop selected by the farmers as compared to cultivation of rice. The third important reason cited is the prospect of higher yield per hectare of land area, followed by the encouragement from success stories of other farmers who have adopted the trade. The fifth reason is the availability of ready market for the sale of the horticulture produce. The sixth reason is the opportunity of exporting the produce, followed by the requirement of low financial investment with regard to the crop. The other reasons cited are the fact that horticulture farming can be less labour intensive and there are avenues for receiving support from the government.

### *Major problems faced by horticulture farmers*

- Lack of capital resources – While discussing about the problems faced by the farmers, most of the farmers responded that they face financial constraints to invest in their trade, be it in terms of tools and equipments, fertilizers, water resources, manpower resources and quality seeds and seedlings.
- Poor technical knowledge – Cultivation of different horticulture crops require technical knowledge to some extent. Farmers are often unaware of the best practices to produce better quality and higher yields from their crops. The Horticulture Department, government of Mizoram conducts training programs in this regard from time to time. From the survey, it was found that only 35 percent of the respondents have attended the training programs organised by the government.
- Lack of support from the government – Many of the respondents revealed that not much support from the government is obtained. Government support is required in terms of spreading awareness of the

trade, investment in post-harvest technology and assistance in sales and marketing of the produce.

- Lack of manpower – Farming requires manpower to produce better yields. Lack of manpower, in particular lack of skilled manpower is a significant constraint faced by the horticulture farmers.

- Absence of post-harvest management facilities – Proper post-harvest management is a serious problem faced by the horticulture farmers. Absence of post-harvest technology results in post-harvest losses such as crop spoilage, loss of sale and reduced market price for produce. Facilities such as cold storage, drying, transportation, processing, packaging and marketing is required to increase the income of the horticulture farmers.

- Limited land area available for cultivation – Many farmers cited lack of available land for cultivation as a hindrance towards expanding their trade. Farmers have limited land area and often, the terrain is unsuitable for cultivation.

- Heavy reliance on middlemen for sales and marketing functions – Majority of the farmers are ignorant of the sales and marketing aspects of their trade. They rely on middlemen for sales and distribution of their produce. This reduces their earning potential to a great extent.

## Conclusion

Horticulture sector is an important growth area for the economy of Mizoram. Agro-based industry dependent on horticultural crops is the most viable industry for Mizoram. Although the sector has gained prominence and achieved several success stories due to the efforts of Department of Horticulture, government of Mizoram in the recent years, there is still much to do. There exists a significant gap between the potential and actual yield of the various crops. Widespread adoption of modern farming methods is required by the cultivators. Quality control, branding and promotion are important areas that need improvement. More investment must be made in post-harvest technology. The active involvement and participation of funding institutions and other stakeholders is required for the healthy growth of the horticulture sector in Mizoram.

## References

- Agarwal, N. L. and Acharya, S. S. (2004), *Agricultural Marketing in India*, Oxford & IBH Publishing Co. Pvt Ltd.
- Achterbosch, T., Allbritton, A., Quang, D. V., Eaton, D., de Jager, A., Meijerink, G., & Van Wijk, S. (2007). "Poverty Alleviation in the Horticulture Sector: Insights from Uganda and Vietnam". In 106th European Association for Architectural Education (EAAE) Seminar, Pro-poor Development in Low Income Countries: Food, Agriculture, Trade and Environment. October (25-27).
- Asfaw, S., Mithöfer, D., & Waibel, H. (2010). "What impact are EU supermarket standards having on developing countries' export of high-value horticultural products? Evidence from Kenya". *Journal of International Food & Agribusiness Marketing*, 22(3-4), 252-276.
- Baliyan, S. P., & Kgathi, D. L. (2009). "Production and marketing problems in small scale horticultural farming in Botswana". In XVI International Symposium on Horticultural Economics and Management, 831, pp. 31-40.
- Bansil, P.C., (2008), *Horticulture in India*, CBS Publisher, New Delhi.
- Barendse, H. F. J. (1987). "The conditions for a successful introduction of the auction system in horticulture". In X International Symposium on Horticultural Economics, 223, pp17-23.
- Chadha, K.L. (2006), *Handbook of Horticulture*, Directorate of Information and Publications of Agriculture, New Delhi.
- Chadha, K.L., Singh, A.K., and Patel, V.B. (2010), *Recent Initiatives in Horticulture*, The Horticulture Society of India, New Delhi.
- Chauhan, Gian C. (2004), *Marketing of Perishable Horticultural Produce*, in Sharma, V.K., "Advances in

- Horticulture”, Deep and Deep Publications Pvt. Ltd., New Delhi.
- Codron, J. M., Bouhsina, Z., Fort, F., Coudel, E., & Puech, A. (2004). “Supermarkets in Low-income Mediterranean Countries: Impacts on Horticulture Systems”. *Development Policy Review*, 22(5), 587-602.
- Dastagiri, M. B., & Immanuelraj, T. K. (2012). “Supermarket Supply Chains in Horticulture in India: The Novel Marketing Models, Effects and Policies”. *Agrotechnol*, S11, 1, 2.
- Deere. John (1995), *Marketing Agricultural Commodities*, Deere & Company, Moline, Illinois.
- Ghosh, Nilabja (2013), *India's Agricultural Marketing: Market Reforms and Emergence of New Channels (India Studies in Business and Economics)*, Springer, New York.
- Gray, Ann and Kleih, U. (1997), *The Potential for Selected Indian Horticultural Products on the European Market (NRI Marketing)*, Natural Resources Institute, Greenwich.
- Horticulture Guide, (2001), Department of Horticulture, Government of Mizoram.
- Kumar, Parmod and Sarkar, Sandeep (2013), *Economic Reforms and Small Farms: Implications for Production, Marketing, and Employment*, Academic Foundation, New Delhi.
- Meena, R.K., and Yadav, J.S. (2001), *Horticulture Marketing and Post Harvest Management*, Pointer Publishers, Jaipur.
- Nath, Thakur Shailendra (2013), *Economics, Marketing and Sales of Agricultural Products*, New India Book Agency, New Delhi.
- Peter, K.V. (2009), *Basics of Horticulture*, New India Publishing Agency, New Delhi.
- Prakash, N., Ngachan, S.V. and Singh, S. B. (2011), *New Perspectives on Marketing of Horticultural Crops in North East India*, Today & Tomorrows Printers and Publishers, New Delhi.
- Prasad, S., and Kumar, U. (2008), *Principles of Horticulture*, Agrobios India, Jodhpur.
- Saraswathy, S., Preethi, T.L., Balasubramanyan, S., Suresh, J., Revathy, N., and Natarajan, S. (2010), *Postharvest Management of Horticultural Crops*, Agrobios, Jodhpur.
- Sati, Vishwambhar Prasad (2004), *Horticulture Development in Hills*, Mittal Publications, New Delhi.
- Sharma, Keshav (1991), *Marketing Management of Horticulture Produce*, Deep and Deep Publications, Delhi.
- Singh, I.S. (2009), *Post-harvest Handling and Processing of Fruits and Vegetables*, Westville Publishing House, New Delhi.
- Singh, V.B., Sema, K.Akali, and Alila, Pauline (2006), *Horticulture for Sustainable Income and Environmental Protection*, Concept Publishing Company, New Delhi.
- Tiwari, Bipin, Beohar, Rajeev and Singh, Sanjay (2007), *Marketing Promotion Policies in Agriculture in India*, Sarup & Son, New Delhi.
- Wolde, B. (1989, July). “Horticulture marketing systems in Ethiopia”. In *I International Symposium on Horticultural Economics in Developing Countries*, 270, 21-32.
- Zaibet, L., & Dharmapala, P. S. (1999). “Efficiency of government-supported horticulture: the case of Oman”. *Agricultural Systems*, 62(3), 159-168.
- [www.horticulture.mizoram.gov.in](http://www.horticulture.mizoram.gov.in)
- [www.horticulture.bih.nic.in](http://www.horticulture.bih.nic.in)
- [www.fao.org](http://www.fao.org)
- [www.igidr.ac.in](http://www.igidr.ac.in)
- [www.nhb.gov.in](http://www.nhb.gov.in)
- [www.archive.india.gov.in](http://www.archive.india.gov.in)
- [www.indiaagronet.com](http://www.indiaagronet.com)
- [www.icar.org.in](http://www.icar.org.in)



# Customer Perception About Service Quality of United Bank of India and State Bank of India: A Comparative Study

Kingshuk Adhikari\*  
Biswajit Paul\*\*

## Abstract

With the opening up of the economy, banks are operating no more in a less competitive and semi-protected environment rather they are expected to operate in a highly competitive and dynamic environment. In such an intensified competitive situation, offering quality services to the customers has become indispensable for every bank. Deliverance of quality services by the banks make their customers feel satisfied and thereby enable them to build long term relationships with their customers. Perceived service quality has been considered to be an important hallmark of competitiveness for banking business in the era of cut-throat competition. Infact, banks offering quality services will find a suitable survival in a fiercely competitive banking environment.

The present paper makes an attempt to compare the perception of customers about select dimensions of service quality of United Bank of India (UBI) and State Bank of India (SBI) in Cachar district of Assam. In order to arrive at the findings of the study, statistical tools, such as, mean, standard deviation, Levene's F-test and Independent sample t-test have been applied. The study reveals significant difference between the perception of customers of United Bank of India and State Bank of India with respect to all the select dimensions of service quality expect tangibility dimension at 5% level of significance.

Keywords: Reliability, Tangibility, Responsiveness, Assurance, Care.

## Introduction

The political system of a country generally plays a significant role in deciding the type of economic system to be followed and it, in turn, dictates the type of relationship between the buyers and the sellers of that country. If the system of governance is democracy and also the industrialization is quite old in a country then it is quite likely that the country will practice market economy in which the bargaining power is more with the buyers. It is not out of context to point out that if the buyers are stronger than the sellers in the market in terms of their bargaining power, the sellers will experience a lot of competition among themselves. Competition among the sellers will naturally provide this opportunity to buyers to look towards such seller who can provide them a variety of such products and services which not only are better in terms of quality but also can be bought at a competitive price (Adhikari and Paul, 2015).

Financial sector reforms coupled with liberalization and globalization, has almost affected all the sectors of the economy and the Indian banking sector is no exception to this. With the increased level of competition in the era of globalization, the need for enhanced service quality in banking sector has gained paramount importance (Anuradha, 2012). To survive in such a precarious situation, banks need to deliver quality services to their customers which, in turn, will not only fulfill the present needs of the customers satisfactorily but also will anticipate the future needs of the customers. Therefore, in this highly competitive banking environment, banks offering quality services to their customers will always find themselves in an advantageous position than their competitors.

Service Quality enables a service firm to develop a partnership with its customers and to gain a competitive edge. It is an evaluation of specific attributes. Service quality deals with the interaction between the firm and its customers (Hernon and Nitecki, 2001). It helps the service firms attract more and better customers to the business. When service is good, a company gains a higher market share and the ability to charge more for services than the competition (Zeithaml and Bitner, 1996). Perception about service

\*Assistant Professor, Department of Commerce, Assam University, Silchar E-mail: adhikari.au@gmail.com

\*\*Research Scholar, Department of Commerce, Assam University, Silchar E-mail: bpaul1987@gmail.com

quality is conceptualized as a global judgement or overall evaluation or attitude relating to the superiority of the service (Parasuraman, Zeithaml and Berry, 1988). In other words, perceived service quality is actually the extent to which a service firm successfully serves the purpose of customers (Parasuraman, Berry and Zeithaml, 1991).

### **Review of Literature**

The review of literature forms the basis in selecting the service quality dimensions for the present study. Adhikari and Paul (2014) revealed that the perception of customers was highest with reliability dimension followed by responsiveness, assurance, tangibility and empathy dimensions of service quality. Muyeed (2012) & Shafie, Azmi and Haron (2004) found that customers' perception of services was highest with reliability dimension. Johnston (1995) identified eighteen important determinants, namely, access, aesthetics, attentiveness/helpfulness, availability, care, cleanliness/tidiness, comfort, commitment, communication, competence, courtesy, flexibility, friendliness, functionality, integrity, reliability, responsiveness and security used to measure the service quality of banks. Jain, Gupta and Jain (2012) concluded that perceived service quality was the highest in case of responsiveness followed by reliability, assurance, empathy and tangibility. Paul and Adhikari (2015) inferred that assurance dimension has been one of the significant dimensions of service quality determining the customers' perception of service quality of a bank.

The review of literature points out that the perception of bank customers is largely influenced by the service quality dimensions. Thus, five dimensions of service quality, namely, reliability, tangibility, responsiveness, assurance and care have been selected for the present study.

### **Objectives of the Study**

- 1) To compare the perception of customers about select dimensions of service quality of United Bank of India and State Bank of India in Cachar district of Assam.
- 2) To compare the perception of customers regarding overall service quality of United Bank of India and State Bank of India in Cachar district of Assam.

### **Hypotheses**

- 1) There exists no significant difference between the perception of customers of United Bank of India and State Bank of India about select dimensions of service quality.
- 2) There exists no significant difference between the perception of customers of United Bank of India and State Bank of India regarding overall service quality.

### **Research Methodology**

The present study is based on primary data. The population of the study includes household segment customers from the branches of United Bank of India and State Bank of India operating in Cachar district of Assam. The sample size for the present study is 83 customers taking 40 customers from the branches of United Bank of India and 43 customers from the branches of State Bank of India operating in Cachar district of Assam. The survey instrument of the study has been designed with five dimensions, namely, reliability, tangibility, responsiveness, assurance and care consisting of 25 statements as well as three statements for overall service quality. A five point scale ranging from Strongly Disagree (= 1) to Strongly Agree (= 5) has been used to record the perception of bank customers. For the purpose of analyzing the responses of bank customers, mean, standard deviation, Levene's F-test and t-test have been used.

### **Scope and Limitations of the Study**

- 1) The scope of the present study is confined to the customers of United Bank of India and State Bank of India in Cachar district of Assam.
- 2) The sampling method adopted for collecting the data may not completely eliminate the possibility of sampling errors.
- 3) Each study area has its own demographic, geographic, situational and cultural specificities. So, the

findings of the study need to be interpreted with great caution while making any kind of generalization.

### Data Analysis and Interpretation

Table 1 reveals the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about reliability dimension of service quality. In order to assess the perception of the customers about reliability dimension of service quality, responses of customers on five different components of this dimension have been considered. The mean values imply that perception of customers with respect to reliability dimension is higher in United Bank of India as compared to State Bank of India. But the values of standard deviation indicate that variation in the responses of customers is more in case of State Bank of India. It is to be mentioned that customers' perception with respect to reliability dimension of service quality is not only relatively higher in case of United Bank of India but also concentrated in case of United Bank of India which is evident from the values of standard deviation.

Table 1. Bank Wise Perception of Customers on Reliability Dimension of Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	4.05	0.539	2.945	0.004
State Bank of India	3.68	0.603		

Source: Field Survey

The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for assurance dimension. Hence, assuming equal variances t value has been calculated for perception of customers with respect to reliability dimension of service quality across the two banks under consideration. The corresponding p value obtained is lower than 0.05 and this implies that there is significant difference in the perception of customers across the two banks about reliability dimension of service quality.

Table 2 shows the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about tangibility dimension of service quality. In order to assess the perception of the customers about tangibility dimension of service quality, responses of customers on five different components of this dimension have been considered. The mean values imply that perception of customers with respect to tangibility dimension is higher in United Bank of India as compared to State Bank of India. However, the values of standard deviation indicate that variation in the responses of customers is more in case of United Bank of India. Although the customer perception with respect to tangibility dimension of service quality is relatively higher, the values of standard deviation clearly indicate that the responses of customers are more concentrated in case of State Bank of India.

Table 2. Bank Wise Perception of Customers on Tangibility Dimension of Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	3.95	0.684	1.023	0.309
State Bank of India	3.80	0.652		

Source: Field Survey

The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for this dimension. Hence, assuming equal variances t value has been calculated for perception of customers with respect to tangibility dimension of service quality across the two banks under consideration. The corresponding p value obtained is greater than 0.05 and this implies there is no significant difference in the perception of customers across the two banks about tangibility dimension of service quality.

Table 3 reveals the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about responsiveness dimension of service quality. In order to assess the perception of the customers about responsiveness dimension of service quality,

responses of customers on five different components of this dimension have been considered. The mean values imply that perception of customers with respect to responsiveness dimension is higher in United bank of India as compared to State Bank of India. But the values of standard deviation indicate that variation in the responses of customers is more in case of State Bank of India. It is to be mentioned that customers' perception with respect to responsiveness dimension of service quality is not only relatively higher in case of United Bank of India but also concentrated in case of United Bank of India which is evident from the values of standard deviation.

Table 3. Bank Wise Perception of Customers on Responsiveness Dimension of Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	3.72	0.648	2.912	0.005
State Bank of India	3.28	0.712		

Source: Field Survey

The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for responsiveness dimension. Hence, assuming equal variances t value has been calculated for perception of customers with respect to responsiveness dimension of service quality across the two banks under consideration. The corresponding p value obtained is lower than 0.05 and this implies that there is significant difference in the perception of customers across the two banks about responsiveness dimension of service quality.

Table 4 depicts the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about assurance dimension of service quality. In order to assess the perception of the customers about assurance dimension of service quality, responses of customers on five different components of this dimension have been considered. The mean values imply that perception of customers with respect to assurance dimension is higher in United bank of India as compared to State Bank of India. But the values of standard deviation indicate that variation in the responses of customers is more in case of State Bank of India. It is to be mentioned that customers' perception with respect to assurance dimension of service quality is not only relatively higher in case of United Bank of India but also concentrated in case of United Bank of India which is evident from the values of standard deviation.

Table 4. Bank Wise Perception of Customers on Assurance Dimension of Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	4.53	0.454	4.503	0.000
State Bank of India	3.97	0.641		

Source: Field Survey

In order to test the significance of differences in the perception of customers of United Bank of India and State Bank of India regarding assurance dimension of service quality, independent samples t-test is used. The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for assurance dimension. Hence, assuming equal variances t value has been calculated for perception of customers with respect to assurance dimension of service quality across the two banks under consideration. The corresponding p value obtained is lower than 0.05 and this implies that there is significant difference in the perception of customers across the two banks about assurance dimension of service quality.

Table 5 shows the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about care dimension of service quality. In order to assess the perception of the customers about care dimension of service quality, responses of customers on five different components of this dimension have been considered. The mean values imply that perception of customer with respect to care dimension is higher in United bank of India as compared to State Bank of India. However, the values of standard deviation indicate that variation in the responses of customers is more in case of United Bank of India. Although the customer perception with respect to care dimen-

sion of service quality is relatively higher, the values of standard deviation clearly indicate that responses of customers are more concentrated in case of State Bank of India.

Table 5. Bank Wise Perception of Customers on Care Dimension of Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	3.51	0.658	2.672	0.009
State Bank of India	3.13	0.621		

Source: Field Survey

The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for this dimension. Hence, assuming equal variances t value has been calculated for perception of customers with respect to care dimension of service quality across the two banks under consideration. The corresponding p value obtained is lower than 0.05 and this implies there is significant difference in the perception of customers across the two banks about care dimensions of service quality.

Table 6 reveals the perception of customers of different branches of United Bank of India and State Bank of India operating in Cachar district of Assam about overall service quality. In order to assess the perception of the customers about overall service quality, responses of customers on three different components of overall service have been considered. The mean values imply that perception of customer with respect to overall service quality is higher in United bank of India as compared to State Bank of India. But the values of standard deviation indicate that variation in the responses of customers is more in case of State Bank of India. It is to be mentioned that customer perception with respect to overall service quality is not only relatively higher in case of United Bank of India but also concentrated in case of United Bank of India which is evident from the values of standard deviation.

Table 6. Bank Wise Perception of Customers on Overall Service Quality

Bank	Mean	SD	t value	p value
United Bank of India	3.48	0.679	2.543	0.013
State Bank of India	3.06	0.791		

Source: Field Survey

In order to test the significance of differences in the perception of customers of United Bank of India and State Bank of India regarding overall service quality, independent samples t -test is used. The result of Levene's F-test for equality of variances is not statistically significant at 95% confidence level for overall service quality. Hence, assuming equal variances t value has been calculated for perception of customers with respect to overall service quality across the two banks under consideration. The corresponding p value obtained is lower than 0.05 and this implies that there is significant difference in the perception of customers across the two banks about overall service quality.

### Major Findings of the Study

- 1) The perception of customers of both the banks has been found highest with respect to assurance dimension and lowest with respect to care dimension of service quality. However, least variation has been observed with respect to assurance dimension in case of United Bank of India and reliability dimension in case of State Bank of India while tangibility and responsiveness dimensions have been observed with highest variation in case of United Bank of India and State Bank of India respectively.
- 2) The perception of customers of United Bank of India has been found higher with respect to all the select dimensions of service quality as compared to the perception of customers of State Bank of India. But the response of the customers of United Bank of India is more concentrated with respect to reliability, responsiveness and assurance dimensions as compared to the responses of the customers of State Bank of India with respect to these dimensions. However, there exists significant difference in the perception of customers between the two banks with respect to all the select dimensions except tangibility dimension of service quality at 5% level of significance.
- 3) The perception of customers of United Bank of India has been found higher with respect to overall

service quality as compared to the perception of customers of State Bank of India. Further, the response of the customers of United Bank of India is also more concentrated with respect to overall service quality as compared to State Bank of India. However, there exists significant difference in the perception of customers between the two banks regarding overall service quality at 5% level of significance.

### Conclusion

With the ever increasing competition in the Indian banking environment, delivery of quality services to customers has become an essential precondition for the Indian banks for their survival and growth. Offering of quality services not only helps in retaining the existing customers but also attracts the potential customers which ultimately increase the profit earning capacity of the Indian banks. It has increasingly become a key element of business strategy. The study revealed that the perception of customers of United Bank of India has been higher about all select dimensions of service quality as compared to the perception of customers of State Bank of India. However, the differences between the perception of customers of United Bank of India and State Bank of India with respect to all select dimensions of service quality expect tangibility dimension have been found significant at 5% level of significance.

### References

- Adhikari, K., and Paul, B. (2014). Customer Perception about Service Quality in State Bank of India: An Empirical Study. *COMED*, 1 (1), 74-81.
- Adhikari, K., and Paul, B. (2015). Perceived Service Quality and Customer Satisfaction in Public Sector Banks: An Empirical Study. *Vidyasagar University Journal of Commerce*, 20, 151-159.
- Anuradha, C. (2012). Quality of Service Evaluation: A Study With Reference To Public Sector Banks in Chennai District. Ph.D Thesis (Unpublished). Department of Business Administration, Manonmaniam Sundaranar University, Tamil Nadu.
- Hernon, P., and Nitecki, D.A. (2001). Service Quality: A Concept Not Fully Explored. *Library Trends*, 49(4), 687-689.
- Jain, V., Gupta, S., and Jain, S. (2012). Customer Perception on Service Quality in Banking Sector with Special Reference to Indian Private Banks in Moradabad Region. *International Journal of Research in Finance and Marketing*, 2 (2), 597-607.
- Johnston, R. (1995). The determinants of service quality: satisfiers and dissatisfiers. *International Journal of Service Industry Management*, 6 (5), 53-71.
- Muyeed, M. (2012). Customer Perception on Service Quality in Retail Banking in Developing Countries- A Case Study. *International Journal of Marketing Studies*, 4 (2), 116-121.
- Parasuraman, A., Berry, L., and Zeithaml, V. (1991). Refinement and Reassessment of the SERVQUAL Scale. *Journal of Retailing* 67 (4), 420-423.
- Parasuraman, A., Zeithaml, V., and Berry, L. (1988). SERVQUAL – A Multi-item Scale for Measuring Consumer Perception of Service Quality. *Journal of Retailing*, 64 (1), 12-16.
- Paul, B., and Adhikari, K. (2015). Service Quality in the Branches of United Bank of India in Silchar: A Perceptual Study on Customers. *Hind Business Review*, 1 (1), 60-64.
- Shafie, S.N., Azmi, W., and Haron, S. (2004). Adopting and Measuring Customer Service Quality in Islamic Banks: A Case Study of Bank Islam Malaysia Berhad. *Journal of Muamalat and Islamic Finance Research*, 1(1), 2-10.
- Zeithaml, V.A., and Bitner, M.J. (2013). *Services Marketing*, McGraw Hill Education (India) Pvt. Ltd., New Delhi.



## Rural Demography and Road Connectivity: An Analysis

Lianhmingthanga\*  
James L.T. Thanga\*\*

### Abstract

One of the factors responsible for markedly spatial pattern of development is connectivity, which refers to the density of connection in road network, the pre-requisite for human sustenance. As such, road infrastructure must have positive impact on the availability of social infrastructure and hence demographic improvement. This study attempts to examine the interrelationship between rural demographic development and road connectivity using the state of Mizoram as a case. The demographic variables adopted are mostly derived from the primary data of Population Census 2011. The study shows the existence of significant relationship between road connectivity and the dynamics of rural demography. Thus, the provision of road connectivity and a good road transport network should be accounted for in every stage of planning for socio-economic development in the rural areas.

Key words: Sex-ratio, Literacy, Workers, Agricultural Labourers, Cultivators.

### Introduction

It is common knowledge that the quality of life enjoyed by people of different economies varies immensely (Diener and Suh, 1997) and that the chances of getting educated, finding a job and escaping poverty is largely dependent upon the economy they are born in (Hull, 2009). One of the factors credited to this markedly spatial pattern of development is connectivity (Khandker et al, 2006; Llanto, 2012). Connectivity refers to the density of connections in path or road network and the directness of links (TDM Encyclopedia, 2015). Considered to be the most important pre-requisite for human sustenance (Oraboune, 2008), it includes communication networks through telephony, internet and postal services, electric connections, health infrastructure, educational infrastructure and transport facilities through road networks (Sum, 2008). Among them, road connectivity is the most fundamental and sought-after connectivity, particularly for the rural areas, due to its flexibility and affordability within the community. Moreover, a nation's socio-economic and cultural growth rate depends on its speedy, safe, economic and efficient transport system in general and road transport system in particular (Masood et al, 2011). Over the years, rural development has become a matter of growing urgency. This is mainly for considerations of social justice, national integration and economic uplift and inclusive growth (Chaudhury, 2012). One of the simplest ways in which the development of an economy can be judged is by its demography because it has been acknowledged as the single most important supply-side determinant of economic activity and employment trends especially in rural areas (Copus, 2006). Moreover, the modern view of development is that the variables - development and population - are inseparable, and that the explanation of trends for one of these cannot be sought in isolation from the other (Mostert, 1985).

Population tends to be spatially concentrated near large cities which have better road networks on average (Dorosh et al, 2011). This denotes that average travel time is inversely related to population size. Moreover, the provision of road infrastructure was found to have a close relationship with the availability of schools and other social infrastructure (Parida, 2014; Banerjee and Sachdeva, 2015) which in turn would promote the quality of population through increase in literacy rates. In villages with all weather roads, not only do new and additional employment and business opportunities tend to increase (Golmohammadi, 2012) but also of female wage employment (Lokshin and Yemtsov, 2005).

The above arguments points to the fact that there is a close and positive relationship between road

---

\*Research Scholar, Department of Economics, Mizoram University, Email: vhminga@yahoo.com

\*\*Assistant Professor, Department of Economics, Mizoram University, Email: jametea@yahoo.com

connectivity and demographic status of the population. Therefore, it is an academic interest to embark on a study of such relationship taking the rural areas of Mizoram as a case.

### **Statement of Key Variables**

Demography, the study of population, is an important branch of social science that helps in the establishment of a more holistic view of socio-economic development (Hirschman, 1981). Its indicators include population size, population growth rate, crude birth rate, crude death rate, total fertility rate, life expectancy and infant mortality; and also encompass estimated and projected gender and age distributions according to medium, high, low and constant fertility variants (Thomson, 2007). In short, demographic changes affect all areas of human activity: economic, social, cultural and political (The Hindu, 2015). The present study identified and examined the size of population, its density, sex ratios, child-population ratio, and number of households, family size and literacy rates. Moreover, it accounted for worker's percentage, sex ratio and the percentage of main and marginal workers and the breakup into cultivators, agriculture labourers and household industry workers of these two categories of workers. On the other hand, as road connectivity is being considered a primary requirement for development, the main criterion of the study is the status of road infrastructure. Four sets of road connectivity variables were introduced in the study – whether the village is connected with AWR or not (in short, AWR Connectivity); whether it lies along the main transport route or outside (Main Transport Route); distance of the non-connected village from the nearest AWR (Distance from AWR); and road density of the village (Road Density).

### **Research Methodology**

#### **a) Sources of Data**

In assessing the indicators of road connectivity and demographic status of the study area, the sampling frame is basically the list of villages, rather than individuals. As such, the target of the research is the examination of the village information on development as well as connectivity. It may be noted that different variables having diversified sources were used; the basis comprises of official sources, raw primary data of Population Census 2011 and interviews of various stakeholders. The main sources of data with the conceptual scopes are enumerated as below.

#### **1) Study Area and Coverage**

The study accounts for only the rural parts of the Mizoram State and as such, the urban areas – the state capital and the 23 notified towns and Aizawl city– were excluded. The focus of the study is therefore on the 704 inhabited villages identified by the Population Census 2011. However, following the data of Geographic Information System (GIS) obtained from Mizoram Remote Sensing Application Centre (MIRSAC), some of the villages hypothesized to be having the same characteristics (as they are located relatively nearer to each other) and the villages smaller in comparison were merged with other villages thus making the total number of villages amount to 517. It would also be important to note that the total population accounted for in the study is 5,25,435 which is the same with the total rural population of the state given in the 2011 Census.

#### **2) Connectivity Variables**

a) AWR Connectivity. The Mizoram State Public Works Department (PWD) was queried on the status of the study areas whether they are connected with AWR or not. However, for the villages that cannot be obtained from the same, the Village Councils were contacted through letters and through telephonic enquiry of their status of connectivity. The data so obtained was then fitted to the respective villages thus showing qualitatively the connectivity status of the villages – those connected with AWR and those that are not. The study found the total number of connected villages to be 270 while 247 villages are not connected with AWR.

b) Main Transport Route. As it was felt that the status of the villages on AWR connectivity might fall short if not backed by regular road transport to that village, the parameter on whether it lies along the state's main transport route was earmarked as a connectivity variable as well. The data for this variable was determined through interview of various stakeholders, particularly vehicle owners, transport operators and knowledgeable persons, which again was vetted with the Department of Transport, Government of Mizoram for confidence. Thus, the key determinants on whether the villages are located along the main transport route are national highway, state highway and the frequency of vehicles passing through the village. The study identified 112 villages to be along the main transport route while the remaining 405 villages lie outside the route.

c) Distance from AWR. The third parameter of road connectivity is the distance from the nearest AWR for those that are not connected with it. The data for this variable was obtained from two sources – from the Public Works Department, Government of Mizoram and the Village Council of the villages where the bulk of it was attained from the latter. Here, the village councils that could be communicated through telephones were asked how far their village is from the nearest AWR while those that cannot were contacted using letters. The reported distances were then apportioned to the respective villages and thus accounted as a connectivity parameter to check if distance of the village from AWR plays a role in development.

d) Road Density. The data for the fourth variable adopted as a parameter of road connectivity i.e., village's density of road was determined through the estimated area of the village within 1 km from motorable road obtained from the GIS data of MIRSAC. To work this variable out, technical assistance from a GIS expert was sought. The data attained from this source was later on allied with the data sets of the other connectivity variables to complete the road connectivity variables for the study.

### 3. Indicators of Demographic Status

The study divided the indicators of demographic status into two categories in the study – population characteristics and structure of employment. The key variables used in the study under population characteristics are mostly an indicator of population quality viz., sex ratio, child-population ratio, child sex ratio, and family size and literacy rates. On the other hand, the variables taken into account for employment structure are the percentage of workers to total village population, workers' sex ratio, percentage of main workers and marginal workers to total workers and the percentage of cultivators, agricultural labourers and household industry workers in both the main and marginal workers. The data source for these indicators is the untabulated primary data of 2011 Population Census obtained from the Directorate of Census Operations, Mizoram.

#### b) Analytical Framework

Firstly, the differential performances of villages on the various indicators are examined with the t-test for difference of means. Secondly, as it is considered pertinent to the pattern of relationship between demographic changes and road connectivity to have better understanding on the impact of the latter on the former. Accordingly, the Dummy Variable Regression Model is adopted which comprises of development variables as the dependent variable and the qualitative and quantitative variables of road connectivity as explanatory variables. While two connectivity variables, namely road density and distance from nearest AWR are quantifiable, the AWR connectivity is of a qualitative nature. Thus, the value 1 and 0 were assigned for connected and unconnected villages respectively. The same is the case for the location of village along the main transport route or not. Accordingly, the model being introduced here is practically Analysis of Covariance (ANOCOVA) dummy regression model. Thus, the following regression model is estimated:

$$Y_i = \beta_0 + \beta_1 D_{1i} + \beta_2 X_{1i} + \beta_3 X_{2i} + U_i$$

where  $Y_i$  = Development variable of interest obtained from the study areas.

$\beta_0$	= Intercept term
$D_{li}$	= 1, if the village is connected with AWR = 0, otherwise
$X_{li}$	= Road Density (village area within 1 km)
$X_{2i}$	= Distance of Village from nearest AWR (km).
$U_i$	= Error term

It may be noted that the status of the village whether it is located along the main route was found to be overlapping with its status on AWR connectivity because those located along main route are connected by AWR. There will therefore be a dummy variable trap if both are simultaneously introduced in the same model. It was thus decided to exclude the dummy variable of main route, while adopting the AWR connectivity dummy as it has better significance of difference in most of the cases and is the most commonly accepted indicator of rural road connectivity in economic literature (Parida, 2014; Ibok and Daniel, 2013; Ulimwengu et al, 2009; Mu and van de Walle, 2007; Khandker et al, 2006).

### Results and Discussion

The result of t-test for the difference in basic demographic indicators villages having different road connectivity status is shown in Table 1, while Table 2 presents the differences in composition of workers in these villages. From Table 1, it can be seen that the t-statistic is significant for the classification of 'AWR Connectivity' in most of the cases except Population Density, Sex Ratio and Child Sex Ratio. A similar trend can be seen in the 'Main Route' Classification and 'Road Density' Classification. This means that there are significantly different population structures between the respective categories of these classifications i.e., between the villages connected and not connected with AWR (AWR Connectivity classification), between the villages along main transport route and outside main route (Main Route classification) and between villages with higher and lower road density (Road Density classification).

In other words, villages having different connectivity status have shown significantly different structure of population which can be construed as an impact of road connectivity. It can thus be concluded that road connectivity leads to significant differences in population quality between villages with better road connectivity and those with poor connectivity status while at the same time favouring the former. However, the test observed that the 'Distance' classification (i.e., distance of village from nearest AWR) does not show significant differences on the population development between the two categories of villages under it.

Table 1. T-test for Difference in Basic Demographic Indicators

Sl. No.	Variable t-value for difference of means				
	AWR Connectivity	Main Route	Distance	Road Density	
1	Total Population	6.20***	6.48***	0.82	7.99***
2	Population Density	1.44	-0.25	2.44*	-1.22
3	Sex Ratio	1.20	0.61	-1.16	1.90
4	Child - Population Ratio	-7.26***	-6.46***	-0.36	-6.85***
5	Child Sex Ratio	-0.06	0.65	-0.47	1.04
6	Number of households	6.62***	7.24***	0.86	8.41***
7	Family Size	-3.56***	-5.14***	-0.33	-3.77***
8	Literacy Rate	5.23***	5.47***	-0.95	7.24***
9	Female Literacy Rate	5.10***	5.43***	-1.12	7.20***

\*\*\* - significant at all levels, \*\* - significant at 1%, \* - significant at 5%

Source: Census, 2011

Table 2. t-test for Difference in the Composition of Workers

Sl. No.	Variable	t-value for difference of means			
		AWR Connectivity	Main Route	Distance	Road Density
1	Percentage of Workers to Total Population	1.15	2.20*	0.52	3.10**
2	Workers' Sex Ratio	-0.98	-0.39	-1.66	0.71
3	Main Workers (% to Total Workers)	2.41*	0.67	2.05*	1.68
	Cultivators	-2.11*	-3.99***	1.72	-0.31
	Agriculture Labourers	3.06**	4.33***	0.20	0.68
	Household Industry Workers	0.59	1.03	-1.15	2.43*
4	Marginal Workers (% to Total Workers)	-1.68	-0.36	-1.58	-0.82
	Cultivators	-1.26	-1.24	-1.13	-0.53
	Agriculture Labourers	4.70***	5.12***	0.02	2.18*
	Household Industry Workers	0.39	0.99	-0.82	1.59

\*\*\* - significant at all levels, \*\* - significant at 1%, \* - significant at 5%

Source: Census, 2011

With respect to the difference in the composition of workers classification across the villages having varying connectivity status, the following observations are noted. Significant difference is observed between the villages connected and unconnected by AWR in case of the percentage of total main workers, main cultivators, main agricultural labourers and marginal agricultural labourers. The positively significant percentage for main workers indicates the higher status of workers who have longer employment in the year in case of the connected villages as per the workers' classification by Census. Of the persons who are categorised as main workers, more number of cultivators is observed in case of unconnected villages as indicated by the negative value of the statistic. At the same time, the positive statistic for agricultural labourers may be taken as the existence of comparatively higher number of persons working in others' farm as labourers in case of the villages connected by AWR. In addition, the number of persons involved in agriculture as marginal labourers is found to be higher for the connected villages. More or less similar cases as AWR Connectivity are observed in the location of villages, whether it is along main transport route or not, except in case of total work participation. The total work participation presented as a percentage of workers' population in the total population is found to be higher in the well connected villages; which is also found in case of Road Density. Thus, a clear conclusion that can be observed from Table 2 is that though the percentage of main workers is higher in the connected villages, the existence of agricultural labourers is greater; while more number of cultivators is found in the unconnected villages.

The result of the estimated dummy variable regression of rural demography on connectivity variables is presented in Table 3. Though the estimated R-Square is quite low in all cases, the table shows that the calculated F-statistics are significant. This suggests the significance of the estimated regression equation of population quality on road connectivity. This is in line with the result of the t-test presented above. In addition, the calculated condition index as an indicator on the presence of multicollinearity is 4.83 which is in the acceptable range (Gujarati et al, 2012).

Table 3. Estimated Regression of the Population Quality on Road Connectivity

(Figure in bracket indicates significance level)

Sl. No.	Dependent Variable	Constant	Coefficient of Independent Variables			R-square	F-Statistic
			AWR Connectivity	Road Density	Distance from AWR		
1	Total Population	593.50 (0.000)	250.92 (0.015)	34.53 (0.000)	3.35 (0.313)	0.174	35.92 (0.000)
2	Population Density	61.30 (0.200)	88.30 (0.126)	-4.78 (0.048)	-0.70 (0.706)	0.012	2.02 (0.110)
3	Sex Ratio	923.09 (0.000)	20.00 (0.048)	0.79 (0.061)	0.94 (0.004)	0.024	4.16 (0.006)
4	Child-Population Ratio	194.07 (0.000)	-14.97 (0.001)	-0.66 (0.000)	0.10 (0.462)	0.118	22.96 (0.000)
5	Child Sex Ratio	974.38 (0.000)	-41.51 (0.143)	5.27 (0.000)	0.30 (0.741)	0.037	6.64 (0.000)
6	No. of Households	114.77 (0.000)	55.17 (0.008)	7.23 (0.000)	0.70 (0.288)	0.190	40.16 (0.000)
7	Family Size	5.09 (0.000)	-0.09 (0.162)	-0.01 (0.001)	0.00 (0.938)	0.046	8.16 (0.000)
8	Literacy Rate	62.52 (0.000)	5.74 (0.007)	0.40 (0.000)	0.06 (0.391)	0.088	16.44 (0.000)
9	Female Literacy Rate	57.47 (0.000)	6.84 (0.009)	0.49 (0.000)	0.07 (0.399)	0.085	15.84 (0.000)

Condition Index (CI) as indicator on the presence of multicollinearity equals 4.83

Source: Census, 2011

It is observed that the coefficients of AWR Connectivity are significant in most of the cases apart from Population Density, Child Sex Ratio and Family Size. The positively significant coefficient implicates increase in population size, sex ratio, number of households, literacy rate and female literacy rate with AWR connection while the negatively significant coefficient suggest the decline in child-population ratio with AWR connectivity of the village. Thus, it is safe to conclude that population development is directly associated with AWR connectivity taking low dependency ratio (child-population ratio) as one of the development parameters.

The estimated coefficient on Road Density was found to be significant at 5 percent level in most of the cases while for Sex Ratio, it is significant at 10 percent level. It is interesting to note that the coefficients are positive for Population, Sex Ratio, Child Sex Ratio, Number of Households, Literacy Rate and Female Literacy Rate while it is negative for Population Density, Child-Population Ratio and Family Size. It is thus clear that the increase in road density is strongly related to population quality. However, the estimated coefficient of distance of the village from the nearest AWR, which otherwise may be taken as access to road communication throughout the year, was found to be significant only for Sex Ratio.

Table 4 presents the result of the estimated regression coefficient for various indicators of the structures of employment in the village on the three connectivity variables. The calculated F-statistic as an indicator on the significance of the estimated regression is not significant for Workers' Sex Ratio, Household Industry Workers (Main), Marginal Workers (Cultivators and Household Industry Workers). Moreover, the estimated R-square is very low in most of the cases; which suggests a weak impact of rural road connectivity in shaping the situation of employment and its composition in rural areas. This may otherwise be taken as low industrial development in rural areas of Mizoram which normally comes with the improvement of road infrastructure (Shiferaw et al, 2012).



Table 4. Estimated Regression of the Composition of Workers on Road Connectivity

(Figure in bracket indicates significance level)

Sl. No.	Dependent Variable	Constant	Coefficient of Independent Variables			R-square	F-Statistic
			AWR Connectivity	Road Density	Distance from AWR		
1	Percentage of Workers to Total Population	49.41 (0.000)	-2.09 (0.132)	0.20 (0.001)	-0.08 (0.076)	0.033	5.80 (0.001)
2	Workers' Sex Ratio	722.53 (0.000)	-16.93 (0.575)	1.67 (0.184)	0.99 (0.310)	0.007	1.82 (0.316)
3	Percentage of Main Workers to Total Workers	89.96 (0.000)	-0.55 (0.782)	-0.02 (0.783)	-0.22 (0.001)	0.034	5.94 (0.001)
	Cultivators	77.00 (0.000)	-6.62 (0.020)	-0.16 (0.169)	-0.19 (0.035)	0.020	3.45 (0.016)
	Agriculture Labourers	3.04 (0.022)	1.84 (0.251)	0.12 (0.076)	-0.03 (0.504)	0.025	4.42 (0.004)
	Household Industry Workers	0.36 (0.012)	0.05 (0.789)	0.01 (0.088)	0.00 (0.453)	0.007	1.21 (0.304)
4	Percentage of Marginal Workers to Total Workers	5.58 (0.000)	-0.10 (0.928)	0.03 (0.532)	0.08 (0.029)	0.015	2.61 (0.051)
	Cultivators	43.02 (0.000)	1.87 (0.697)	-0.03 (0.891)	0.31 (0.044)	0.011	1.93 (0.123)
	Agriculture Labourers	8.81 (0.000)	8.48 (0.005)	0.09 (0.472)	-0.04 (0.654)	0.043	7.60 (0.000)
	Household Industry Workers	2.53 (0.010)	-0.36 (0.757)	0.08 (0.117)	0.00 (0.972)	0.005	0.88 (0.450)

Source: Census, 2011

It can be observed that the estimated coefficient of AWR Connectivity is insignificant for all major classification of workers, while it is significant for Cultivators (Main) and Agricultural Labourers (Marginal). The negatively significant Cultivators (Main) may implicate the situation that shifting cultivation remains the main provider of employment in the unconnected villages. At the same time, the significant estimate for Agricultural Labourers (Marginal) may imply scarcity of land for jhumming which compel many workers to work in other people's farm and the adoption of shifting cultivation as a mere subsidiary livelihood in the villages connected with AWR.

Further, the estimated coefficients of Road Density are significant and positive for percentage of Workers to Total Population and Agricultural Labourers showing their increase with the increasing road density. The coefficient for Distance from AWR are significant for Main Workers, Cultivators (Main), Marginal Workers and Cultivators (Marginal). The negative coefficient for percentage of Main Workers shows its decrease with the increase in the distance from AWR while the positive value for Marginal Workers suggests the increasing percentage of marginal workers with the declining distance from AWR.

### Conclusion

Based on the analysis of rural demography and road connectivity presented above, the following conclusions can be drawn. First, it can be observed from the t-test that there are significant differences between the villages with better road connectivity and poor road connectivity in most of the key development parameters where the former is endowed with more favourable conditions. Similarly, the estimated regressions are also significant in most of the cases as indicated by the significant F-Statistic.

A clear conclusion that can be drawn from this is that road connectivity is but a significant factor of economic development. This is in line with the findings of several researchers (Ibok and Daniel, 2013; Ulimwengu et al, 2009; Umoren et al, 2009; Oraboune, 2008; Mu and van de Walle, 2007).

Second, the well connected villages are more endowed with several attributes of population development compared with their counterpart – unconnected villages. This may be derived from the higher literacy rate, female literacy rate; while observing lower family size with less child dependency as indicated by low child-population ratio, which is the basic characteristic of more advanced societies across the world. The level of significance and arithmetic sign of the estimated regression coefficient suggest the tendency of this measure to move in this direction with the improvement in road connectivity. Third, it is also observed the situation where the composition of employment is being hardly impacted by road connectivity in most of the cases. However, an interesting observation is the increase of agricultural labourers with better connectivity situation which suggest the existence of land scarcity where the poor landless suffers.

What is clearly shown from the analysis is that there is a close relationship between road connectivity and demographic status of the villages in the study area. Although road connectivity may not be the sole factor in bringing about demographic development, the results from the t-test and regression model shows that road infrastructure is a crucial factor which influences the quality of the population and the composition of workers. As such, the provision of road connectivity and a good transportation network has to be considered in every stage of development planning especially now that development planning has geared itself towards rural development.

## References

- Banerjee, Rakesh and Ashish Sachdeva (2015) 'Pathways to Preventive Health, Evidence from India's Rural Road Program,' USC-INET Research Paper No. 15-19, Online, Extracted from SSRN: <http://ssrn.com/abstract=2636999> or <http://dx.doi.org/10.2139/ssrn.2636999> on 21/10/2015 at 11:00 PM
- Chaudhary, SK (2012), 'Innovative Construction Technology for Quality Construction of Rural Road' in *The Masterbuilder*, August 2012 issue, pp.88-94.
- Copus, Andrew (2006), 'Study on Employment in Rural Areas' European Commission, Belgium.
- Diener, Ed and Eunkook Suh (1997), 'Measuring Quality of Life: Economic, Social and Subjective Indicators' in *Social Indicators Research*, 40: 189-216, Kluwer Academic Publishers, Netherlands.
- Dorosh, Paul, Hyoung Gun Wang, Liangzhi You, Emily Schmidt (2012), 'Road connectivity, population, and crop production in Sub-Saharan Africa,' in *Agricultural Economics* 43 (2012), pp. 89–103, International Association of Agricultural Economists.
- Golmohammadi, Farhood (2012), 'Rural Roads, Sustainable Development and Maintenance of People in Desert Regions; Case Study: South Khorasan Province - East of Iran,' in *International Journal of Science and Engineering Investigations*, Vol. 1, Issue 9, October 2012, pp. 118-133.
- Gujarati, Damodar N, Dawn C Porter and Sangeetha Gunasekar (2012), *Basic Econometrics*, Tata McGraw Hill Education (India) Private Limited, New Delhi.
- Hirschman, Charles (1981), 'The Uses of Demography in Development Planning,' in *Economic Development and Cultural Change*, Vol. 29, No. 3, The University of Chicago, USA.
- Hull, Katy (2009), 'Understanding the Relationship between Economic Growth, Employment and Poverty Reduction,' OECD, *Promoting Pro-Poor Growth: Employment*.
- Ibok, Enefiok and Ekong Daniel (2013), 'The Impact of Rural Roads and Bridges on the Socio-

Economic Development of Akwa Ibom State, Nigeria: An Evaluation,' in Global Journal of Political Science and Administration, Vol.1, No.1, pp. 27-36, September 2013, European Centre for Research Training and Development.

Khandker, Shahidur R., Zaid Bakht, Gayatri B. Koolwal (2006), 'The Poverty Impact of Rural Roads: Evidence from Bangladesh,' World Bank Policy Research Working Paper 3875, April 2006.

Llanto, Gilberto M. (2012), 'The Impact of Infrastructure on Agricultural Productivity,' Phillipine Institute for Development Studies Discussion Paper Series No. 2012-12.

Lokshin, Michael and Ruslan Yemstov (2005), 'Has Rural Infrastructure Rehabilitation in Georgia Helped the Poor?' in The World Bank Economic Review, Vol. 19, No. 2 (2005), pp. 311-333.

Massod, Muhammah Tahir, Azhar Khan, Hasnain A. Naqvi (2011) 'Transportation Problems in Developing Countries Pakistan: A Case-in-Point' in International Journal of Business and Management Vol. 6, No. 11, Canadian Center of Science and Education, Toronto.

Mostert, W.P (1985), 'Demography and Development' in Development Southern Africa, Volume 2, Issue 1, pp. 56-61.

Mu, Ren and Dominique van de Walle (2007), 'Rural Roads and Local Market Development in Vietnam,' Policy Research Working Paper 4340, The World Bank Development Research Group, Human Development and Public Services Team, August 2007.

Oraboune, Syviengxay (2008), 'Infrastructure (Rural Road) Development and Poverty Alleviation in Lao PDR,' Institute of Developing Economies, Online, Extracted from <http://www.ide.go.jp/English/Publish/Download/Dp/pdf/151.pdf> on 20/10/2015 at 01:00 PM.

Parida, Abash (2014) 'Role of Rural Road Connectivity (Pradhan Mantri Gram Sadk Yojana) in Accelerating Development & Improving Quality of Life,' in International Journal of Innovative Research and Development, September 2014, Vol. 3 Issue 9, pp. 67-72.

Shiferaw, Admasu, Mans Soderbom, Eyerusalem Siba, Getnet Alemu (2012), 'Road Infrastructure and Enterprise Development in Ethiopia,' Working Paper, International Growth Centre, London. Online, Extracted from <http://www.theigc.org/wp-content/uploads/2015/02/Shiferaw-Et-Al-2012-Working-Paper.pdf>. on 19/10/2015 at 10:00 AM

Sum, M. (2008), 'Infrastructure Development in Cambodia', in Kumar, N. (ed.), 'International Infrastructure Development in East Asia – Towards Balanced Regional Development and Integration,' ERIA Research Project Report 2007-2, Chiba:IDE-JETRO, pp.32-84.

TDM (Transport Demand Management) Encyclopedia (2015), 'Roadway Connectivity: Creating More Connected Roadway and Pathway Networks,' Victoria Transport Policy Institute, Online, Extracted from <http://www.vtpi.org/tdm/tdm116.htm> (Updated 15 April 2015) on 23/10/2015 at 08:00 PM.

Thomson, Elizabeth (2007), 'What is Demography?' Online, Extracted from <http://www.suda.su.se/docs/What%20is%20Demography.pdf> on 20/10/2015 at 10:00 PM

\_\_\_\_\_ (2015), 'Research in Population Studies,' The Hindu, January 5, 2015. Online, Extracted from <http://www.thehindu.com/todays-paper/tp-miscellaneous/tpothers/research-in-population-studies/article6755422.ece> on 02/10/2015 at 11:00 PM.

Ulimwengu, John, Jose Funes, Derek Headey, Liang You (2009), Paving the Way for Development: The Impact of Road Infrastructure on Agricultural Production and Household Wealth in the Democratic Republic of Congo, Online, Extracted from <http://www.unamur.be/en/eco/eeco/cred/working-papers-files/wp2012/workingpaper-2012-ulimwengu> on 15/10/2015 at 02:00 PM

Umoren, V, EE Ikurekong, A. Emmanuel, AA Udida (2009), 'Development of Road Infrastructure as a Tool of Transforming Ibiono Ibom Local Government Area,' in Global Journal of Social Sciences, Vol. 8, No. 2, 2009 pp.53-59.

## **Firm Characteristics and Capital Structure: Evidence from BSE listed Non-Banking Financial Companies in India**

**Pranesh Debnath\***

### **Abstract:**

The present paper studies the capital structure of Indian BSE listed Non-Banking Financial Companies (NBFCs) through the panel data of 15 years from 2000 to 2014. The objective of this research is to determine the factors affecting the capital structure of companies in India and also to determine which type of theories are being followed by companies for setting their capital structure. Findings of the study suggests that among the various determinants of capital structure liquidity, tangibility and uniqueness are positively correlated to with leverage while profitability, non-debt tax shield and form size are negatively associate with leverage. The result also documented that both the trade-off theory and pecking order theory are in force in the context of capital structure of Indian firm during the study period.

**Keywords:** Capital Structure, Leverage, Non-Banking Financial Companies, BSE.

### **Introduction**

The theories of optimal capital structure or determinants of capital structure are one of the most controversial and debatable issues in modern corporate finance. The issue of the capital structure of firms in both the developed and developing worlds has attracted a large number of theoretical and empirical papers. This interest is expected given the fact that the debt to equity ratio affects the cost and availability of financing funds. In addition, due to the argument that information asymmetry might be more pervasive in developing countries, a growing number of empirical papers examine the determinants of capital structure of firms that are listed on emerging stock markets. One of the main concerns of companies' financial managers is making decisions about the appropriate combination of financial resources and determining the composition of capital structure (Aghaei, Nadem, Noroozi, & Madine, 2011). Based on literature, capital structure is a combination of equity and debts (Kohher & Rahul, 2007). However, it is important for the firm to find the particular combination of debt and equity that maximizes its overall market value. Regarding this fact that capital structure have a direct effect on firm value, researchers try to determine the optimal capital structure which maximize the firm value with lowest cost of financing. In this research, the determinant factors of capital structure of Indian public BSE listed Non-Banking companies is considered. The main research questions are to what extent capital structure are dependent on firm's different character? And lastly between pecking order theory and static trade-off theory which is at work in capital structure decision of Indian companies in general and BSE listed Non-Banking Financial Companies in particular. Many researches had been done on the determinants of capital structure, mostly limited to developed nations very few in developing country from various aspects. Hence it is hard to say whether conclusion from theoretical and empirical researches carried out in developed economies are also applicable for developing too, or a different set of factors work in deciding capital structure in developing economies. However after decades of serious research there is still no universally accepted theory of capital structure available, which leaves the door open for doing further research on the same topic.

The discussion in this paper is organized as follows. In next section (2) the relevant literature to develop research hypotheses is discussed, in section (3) the sample selection, research method and variable measurement are explained, in section (4) the research result is analysed and in section (5) the conclusions of study and suggestions for future researches are discussed.

---

\*Assistant Registrar (Finance), Tripura University, Suryamaninagar-799022. Email: praneshdebnath@gmail.com

## Literature Review

(Handoo & Sharma, 2014) attempted to detect the most important determinants of capital structure of 870 listed Indian firms comprising both private sector companies and government companies for the period 2001 to 2010. The study concluded that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate, and debt serving capacity have significant impact on the leverage structure chosen by firms in the Indian context. (Chechet, Garba, & Odudu, 2013) attempted to assess the determinants of capital structure in Nigerian Chemical and Paints companies listed in Nigeria, for a period of five years from 2005 to 2009. The study reveals that for the Nigerian Chemical and Paints sector, tangibility and profitability have significant impact on leverage at 1% level, while size, growth and age have insignificant impact on the dependent variable. It also shows that the coefficient of the two significant explanatory variables, which are tangibility and profitability are negative. (Huang & Song, 2013) stated that higher tax liability acts as an incentive to use more debt due to the tax deductibility of interest on loan. Therefore there is a positive relationship between effective tax rate and leverage ratio. (Espinosa, Maquieira, & Vieito, 2012) scrutinises the determinants of capital structure considering a sample of 133 Latin American firms with accounting and stock exchange information for the time period 1998-2007. The study observed that capital structure of Chilean firms is: positively related to tangible assets and size; but negatively related to growth opportunities and profitability. (Mishra, 2011) tried to identify the determinants of Indian central PSUs' capital structure considering a sample of 48 profit making manufacturing PSUs for the time period 2006 to 2010. the study concluded that the capital structure (Total Borrowing to Total Assets) of the profit making PSUs is affected by Asset Structure (Net Fixed Assets to Total Assets, NFATA), Profitability (Return on Assets, ROA) and Tax. . (Chen & Roger, The Determinants of Capital Structure: Evidence from Chinese Listed Companies, 2007) Investigate the relationship between firm size, commercial risk, sales growth rate, tax, profitability index and intangible assets with capital structure. The results shows that profitability index, intangible assets, tax and sales growth rate have positive relationship and firm size and commercial risk have negative relationship with capital structure. (Bauer, 2004) analyse the determinants of capital structure of listed companies in the Czech Republic during the period from 2000 to 2001. According to their results, leverage of a firm is positively correlated with size and it is negatively correlated with profitability and tangibility. There is the negative relationship between leverage measured in market value and growth opportunities. Moreover, leverage is positively correlated with tax and negatively correlated with non-debt tax shields (Frank & Goyal, 2003) examined the pecking order theory of corporate leverage on a broad cross-section of publicly traded American companies during 1971 to 1998 by using a sample of 157 companies' financial information during 28 years. The results show that the wide range of sample companies do not comply pecking order theory in their financing process and for needed resources they prefer publishing shares. (Harris & Raviv, 1991) also mentioned that leverage is positively related to non-debt tax shields, research & development expenditure, advertising expenditure and firm's uniqueness. Many study observed that compliance of packing order theory that is leverage is negatively related with profitability in developed countries (Rajan & Zingales, 1995)( Titman & Wessels, 1998) as well as in developing countries (Booth, Aivazian, Demirguc-Kunt, & Maksi, 2001), (Pandey, 2001), Um 2001, (Wiwattanakantang, 1999), (Chen, 2004)and (Sakran, 2001)) while study of (Kim & Berger, 2008) found positive relation between profitability and leverage. Similar to the profitability, (Rajan & Zingales, 1995) (Wiwattanakantang, 1999) observed positive relationship between leverage and tangibility. Because, availability of tangible assets for collateral (Jensen & Meckling, 1976); (Myers, 1977); (Harris & Raviv, 1991). However some other studies like Booth et al, (2001), (Bevan & Danbolt, 2002) (Chechet, Garba, & Odudu, 2013) (Bauer, 2004) intimated a negative relationship between debt and Tangibility. The study piloted by Wald, (1999); Booth et al, (2001); and Pandey, (2001); witnessed a positive relation between firm's growth and debt ratio while the result of Chung, (1993) and Rajan & Zingales, (1995) (Espinosa, Maquieira, & Vieito, 2012)



remarked negative relation. Size of a firm has also found to be a good explanatory variable for its leverage ratio because various study like (Antoniou, Guney, & Paudyal, 2002) (Rajan & Zingales, 1995) (Frank & Goyal, 2003) (Booth, Aivazian, Demirguc-Kunt, & Maksi, 2001) (Antoniou et al, 2002) (Hamaifer, Zietz, & Benkato, 1994) (Titman & Wessels, 1998) (Wiwattanakantang, 1999), (Booth, Aivazian, Demirguc-Kunt, & Maksi, 2001) Pandey (2001), (Sakran, 2001) observed the positive relation between size and leverage.. While study of (Espinosa, Maquieira, & Vieito, 2012) observe negative relation between size and leverage. Deliberation regarding relationship between effective tax rate and leverage is also going on. As higher tax rate would result into lesser availability of internal funds as well as higher cost of capital ultimately dependency of debt capital will increase the capital structure (Haugen & Senbet, 1986) (Harris & Raviv, 1991).

**Hypothesis Development:** From the above literature survey it is hypothesised that

H0: There is no relation between the selected firm-specific determinants and Total Debt Ratio (TDR).

Based on the above hypothesis the present study has observed the following sub hypothesis

H01: There is no relation between profitability and leverage.

H02: There is no relation between liquidity and leverage.

H03: There is no relation between tangibility and leverage.

H04: There is no relation between non-debt tax shield and leverage.

H05: There is no relation between uniqueness and leverage.

H06: There is no relation between size and leverage.

Based on empirical findings around the world, both the static trade-off and the pecking order theories are evident in capital structure decision making. Therefore, it is true that one single theory cannot explain capital structure decision making. Therefore, this study examined that which theory support the capital structure decision of BSE listed non-banking financial companies in India over the last 15 years (2000 to 2014).

### **Objectives of the Study**

The purpose of the present study is to bridge up the gap in existing literature by empirically scrutinising the correlation between the usage of leverage in the capital structure of the companies and factors related to the capital structure in Indian BSE listed Non-Banking Financial Companies. The following are the specific objectives of this study.

1. To assess the role of various characteristics of firm in determining capital structure decision of Indian BSE listed firm.

2. To examine which particular theory or theories of capital structure is/are effective in capital structure of Indian BSE listed firm.

**Methodology and Data collection:**

The present paper studies the capital structure of Non-Banking Financial Companies (NBFCs) listed in Bombay Stock Exchange (BSE) through the panel data of 15 years from 2000 to 2014. The data has been collected from Centre for Monitoring Indian Economy (CMIE). Capital structure has been portrayed by total debt to total assets ratio. By following the different study the present study recognises six explanatory variables viz., profitability, liquidity, tangibility, non-debt tax shield, uniqueness and firm size. The direction and strength of relationship between dependent and independent variables have been tested through spearman's rank correlation coefficient and regression analysis.

### **Dependent variable**

Total Debt Ratio (TDR) = Total Debts / Total Assets

## Explanatory Variables

Profitability (PROF)= PBITD /Total Assets following (Rajan & Zingales, 1995)

Liquidity (LIQD) = Total Current Assets / Total Current Liabilities following (Serrasqueiro & Nunes, 2010)

Tangibility (TANG) = Fixed / Total Assets following (Titman & Wessels, 1998)

Non-debt Tax Shield (NDT) = Depreciation / Total Assets following (Harris & Raviv, 1991)

Uniqueness (UNIQ) = Selling Expenses / Sales following (Harris & Raviv, 1991)

Firm Size (SIZE)= Natural Log of Total Assets following (Ozkan, 2001)

Expected relationship between dependent and independent variables according to different theory of capital structure

Independent Variable	Dependent Variable	Proposed Results	Expected results comparison with CST
UNIQ	TD	[-]	STT
TANG	TD	[+]	STT
SIZE	TD	[+]	STT
PROF	TD	[-]	POT
NDTS	TD	[-]	
LIQD	TD	[-]	

Note: 'CST' stands for capital structure theory; 'STT' stands for static trade-off theory; 'POT' stands for pecking order theory

The individual significance of independent variables has been examined through probability of t statistics and their joint significance has been tested through probability of F statistics. The efficacy of model has been examined through the value of R squared i.e. the extent of variation in dependent variable as explained by independent variables. As the problem of multi-co linearity and serial correlation among variables may result into spurious results of regression therefore at the outset, correlation has been estimated among dependent and independent variables. Thereafter pooled, fixed effect and random effect regression analysis have been conducted to establish the relationship between dependent and independent variables.

### Data Analysis and Interpretation:

Table 1: Estimated Correlations between independent variables

	PROF	LIQD	TANG	NDTS	UNIQ	SIZE
PROF	1					
LIQD	0.3312329	1				
TANG	0.0085545	-0.5601947	1			
NDTS	0.0419778	-0.1793996	0.31008	1		
UNIQ	-0.0721276	-0.063915	-0.1221	-0.12003	1	
SIZE	0.1315136	-0.361135	0.37908	0.30622	0.08774	1

Source: Author's Calculation

From the above table 1 it is clear that, the multicollinearity problem is not too severe between the selected explanatory variables. According to theory of econometrics, if correlation between explanatory variables exceeds the value of 0.80, then the variable is said to be highly collinear. Here the highest correlation is noted between tangibility (TANG) and liquidity (LIQD) is -0.56. Therefore, it can be said that here is no cause for concern about the problem of multicollinearity among the explanatory variables under study.

Table 2. Regression Results of Total Debt Ratio for the year 2000 to 2014

Variables	Coefficient	Std. Error	t-Statistic	Sig.
C (Constant)	10.670	348.959	0.031	0.976
PROF (Profitability)	-0.172	0.011	-15.6363	0.000
LIQD (Liquidity)	4.856	5.348	0.908	0.839
TANG (Tangibility)	0.766	0.005	151.932	0.000
NDTS (Non-Debt Tax Shield)	-0.294	0.052	-5.629	0.000
UNIQ (Uniqueness)	0.037	0.006	5.991	0.000
SIZE (Size)	-0.013	0.007	-1.855	0.001
R-squared	0.659			
Adjusted R-squared	0.648			
F-statistic	32.305			
Prob(F-statistic)	0.000			
Durbin-Watson stat	1.9704			

a. Dependent Variable: TDR

b. Predictors: (Constant): PROF, LIQD, TANG, NDTS, UNIQ, SIZE

Source: Author's Calculation

The Table 2 shows the summary output for the regression results of firm-specific determinants of total debt ratio of BSE listed non-banking financial companies during 2000 to 2014. The R-squared is 0.656 which indicates that about 65 percent of the variability of total debt ratio is explained by the given six explanatory firm-specific variables. The adjusted R-square stands slightly lower than R-squared that is 0.648. The F-statistic of 32.305 with prob (F-statistic) value of (0.00000) suggests that the model fits the data significantly. A Durbin-Watson statistic has a value of 1.9704 which indicates the absence of autocorrelation problem in estimated regression model.

The t-statistic shows that except for the one variable (liquidity), all the selected firm-specific variables appeared significant at 5 percent significance level. Therefore, the first main null hypothesis of  $H_0$  is rejected which mention that there is no relationship exists between the selected firm-specific determinants and debt ratio.

The result shows that profitability, non-debt tax shield and size have exercise significant negative influence over the debt ratio while liquidity and uniqueness shows positive encouragement on leverage though the influence of liquidity is not statistically significant. Therefore,  $H_{01}$ ,  $H_{03}$ ,  $H_{04}$ ,  $H_{05}$ , and  $H_{06}$  are rejected while  $H_{02}$  is accepted from this regression analyses. The variables profitability, non-debt tax shield and size are witnessed negatively related to total debt ratio with coefficient value of -0.172, -0.294 and -0.013 respectively. The liquidity, uniqueness and tangibility shows positive association with total debt ratio and having coefficient value of 4.856, 0.037 and 0.766 respectively. In this analysis only liquidity does not shows any significance relationship with total debt ratio.

Table 3. Summary results of LTD &amp; TD regression and comparison with CST

Independent Variable	Dependent Variable	Proposed Results	Observed Results	comparison with CST
UNIQ	TD	[-]	[+]*	POT
TANG	TD	[+]	[+]*	STT
SIZE	TD	[+]	[-]*	POT
PROF	TD	[-]	[-]*	POT
NDTS	TD	[-]	[-]*	
LIQD	TD	[-]	[-]	

Note: 'CST' stands for capital structure theory; 'STT' stands for static trade-off theory; 'POT' stands for pecking order theory; \* Significant at 0.05 level

This analysis finds uniqueness is a significant determinant of capital structure in total debt ratio and this evidence support for the pecking order theory opposing the proposed hypothesis that there exist negative relation between uniqueness and leverage according to trade-off theory. A firm producing unique or specialized products requires high cost for selling and administrative cost involves high risk often find it difficult to raising equity fund funds. Therefore, they depends more on long-term fixed return bearing debt or equity financing. The finding of this analysis for total debt ratio contradict to the finding of (Titman & Wessels, 1998), where they found significant and negative between leverage ratio and uniqueness of the product.

From the table 3 tangibility appears a significant positive related to capital structure. Thus the third hypothesis is satisfies by the statistically significant positive relationship between tangibility and debt ratio. The finding of positive significant association between tangibility and debt ratio confirm to the prediction of static trade-off theory. The reason behind positive relation is that higher the tangible assets more is that a firm having a large amount of fixed assets can easily raise debt at cheaper rates because of the collateral value of those fixed assets (tangibility).

This analysis found firm size as a negative significance determinant of capital structure for total debt ratio. It means larger firms have lower debt ratio in due to less information asymmetry about them. The present finding indicates a strong compliance to the pecking order theory. The finding of the present analysis contradicts with proposed hypothesis which was based on static trade-off theory that firm size has positive association with debt ratio due to diversification with huge total assets and is less prone to bankruptcy.

The table 3 shows that profitability is one of the most important significant determinants of capital structure for total debt ratio in BSE listed firms. The finding of negative significant relationship between debt ratio and profitability confirms our predicted hypothesis that profitability has negative effects on debt ratio. This finding is similar to the previous finding of (Rajan & Zingales, 1995).

According to table 3 non debt tax shield (NDTS) is a negative determinant of leverage which agreed the propose hypothesis of this study. This study expected negative correlation between NDTS and debt ratio because non-debt tax shields like depreciation reduce the need for debt to stop net income from going to next high tax brackets. Therefore, the existence of non-debt tax shields should discourage leverage and a negative relationship between non-debt tax shields and leverage is expected.

Here liquidity is showing a weak correlation with total debt ratio hence the present study does not find any significant relationship between liquidity debt ratios. It means liquidity is not an important determinant of capital structure in BSE listed companies although the finding of present study does fit well with the expected hypothesis.

## Conclusions

The theories of optimal capital structure or determinants of capital structure are one of the most controversial and debatable issues in modern corporate finance. Many researches had been done on the determinants of capital structure, mostly limited to developed nations very few in developing country from various aspects. Hence it is hard to say whether conclusion from theoretical and empirical researches carried out in developed economies are also applicable for developing too, or a different set of factors work in deciding capital structure in developing economies. However after decades of serious research there is still no universally accepted theory of capital structure available, which leaves the topic open for further research. This study has made an attempt to explore the potential firm-specific determinants of capital structure in Indian corporate scenario. Findings of the study suggests that among the various determinants of capital structure liquidity, tangibility and uniqueness are positively correlated to with leverage while profitability, non-debt tax shield and form size are negatively associate with

leverage of BSE listed Non-Banking Financial Companies and both the trade-off theory and pecking order theory are at work in the context of capital structure of Indian firm during the study period. The result indicates that despite of India not having a developed economic set-up the determinants of capital structure remain same with little variation.

## References

- Aghaei, C., Nadem, A., Noroozi, M., & Madine, M. (2011). The effect of economic and accounting variables on capital structure: empirical evidence from Iranian companies. *International research journal of finance and economics*, 71, 105-111.
- Antoniou, A., Guney, Y., & Paudyal, K. (2002). Determinants of corporate capital structure. Working Paper Available at <http://webkuliah.unimedia.ac.id/ebook/files/determinant-europe.pdf>, 46.
- Bauer, P. (2004). Determinants of Capital Structure Empirical Evidence from the Czech Republic. *Czech Journal of Economics and Finance*, 54, 1-21.
- Bevan, A., & Danbolt, J. (2002). Capital structure and its determinants in the UK: Decompositional Analysis. *Applied Financial Economics*, 12 (3), 159-170.
- Booth, L., Aivazian, V., Demircuc-Kunt, A., & Maksi, A. (2001). Capital structures in developing countries. *The Journal of Finance*, 58 (1), 87-130.
- Chechet, I. L., Garba, S. L., & Odudu, A. S. (2013). Determinants of Capital Structure in the Nigerian Chemical and Paints Sector. *International Journal of Humanities and Social Science*, 3 (15), 247-263.
- Chen, J. (2004). Determinants of capital structure of Chinese-listed Companies. *Journal of Business Research*, 57, 1341-1351.
- Chen, J., & Roger, S. (2007). The Determinants of Capital Structure: Evidence from Chinese Listed Companies. *Economic Change and Restructuring*, 35, 11- 35.
- Chung, K. H. (1993). Asset characteristics and corporate debt policy: an empirical test. *Journal of Business Finance and Accounting*, 20, 83-98.
- Espinosa, C., Maquieira, C., & Vieito, J. P. (2012). Capital Structures in Developing Countries: The Latin American case. *Investigacion Economica*, 35-54.
- Frank, M. Z., & Goyal, V. K. (2003). Testing the Pecking Order Theory of Capital Structure. *Journal of Financial Economics*, 67, 217-248.
- Hamaifer, G., Zietz, J., & Benkato, O. (1994). An empirical model of capital structure: some new evidence. *Journal of Business Finance and Accounting*, 21, 1-14.
- Handoo, A., & Sharma, K. (2014). A study on determinants of capital structure in India. *IIMB Management Review*, 26, 170-182.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 45 (2), 297-355.
- Haugen, R. A., & Senbet, L. W. (1986). Corporate finance and taxes: a review. *Financial Management*, 15, 5-22.
- Huang, S., & Song, F. (2013). The determinants of capital structure: evidence from China. Working Paper Available at [http://www.hiebs.hku.hk/working\\_paper\\_updates/pdf/wp1042.pdf](http://www.hiebs.hku.hk/working_paper_updates/pdf/wp1042.pdf).
- Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 350-360.
- Kim, H., & Berger, P. D. (2008). A comparison of capital structure determinants: The United States and The Republic of Korea. *The Multinational Business Review*, 16, 79-100.
- Kohher, M., & Rahul, B. (2007). Strategic Assets, Capital Structure, and Firm Performance. *Journal of Financial and Strategic Decisions*, 3, 23-36.
- Mishra, C. S. (2011). Determinants of Capital Structure – A Study of Manufacturing Sector PSUs in India. *International Conference on Financial Management and Economics*, 11, 247-252.
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175.

- Ozkan, A. (2001). Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data. *Journal of Business Finance and Accounting* , 28, 175-199.
- Pandey, M. (2001). Capital structure and the Firm characteristics: evidence from an emerging market. Working Paper Available at SSRN: <http://ssrn.com/abstract=300221> .
- Rajan, R., & Zingales, L. (1995). What do know about capital structure?: some evidence from international data. *The Journal of Finance* , 50, 1421-1460.
- Sakran, A. (2001). Leverage determinants in the absence of corporate tax system: The Case of Non-financial Publicly traded Corporation in Saudi Arabia. *Managerial Finance* , 27, 58-86.
- Serrasqueiro, Z., & Nunes, P. M. (2010). Determinants of Capital Structure: Comparison of Empirical Evidence from the Use of Different Estimators. *International Journal of Applied Economics* , 7 (2), 14-19.
- Titman, S., & Wessels, R. (1998). The determinants of capital structure choice. *The Journal of Finance* , 43, 1-19.
- Wald, J. K. (1999). How firm characteristic affect capital structure: an international comparison. *Journal of Financial Research* , 22 (2), 161-188.
- Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal* , 7, 371-403.



## Prospects of Rural and Urban Horticulture in Manipur

Th. Sharatchand Meetei\*  
Kangjam Mukhara Devi\*\*  
W. C. Singh\*\*\*

### Abstract

Horticulture is recognized as an important sector for potential diversification and value addition in agriculture. Manipur is one of the richest reservoirs of genetic variability and diversity of different crops i.e. various kinds of fruits, different vegetables, spices, ornamental plants and also medicinal and aromatic plants. The diversification to horticultural activities in the state has been mainly managed by local farmers both men and women. This case study was conducted in nine (9) districts of the state of Manipur. The methodology of the study is exploratory method. The research targeted the farmers indulging in horticultural activities. This paper tries to highlight mainly the prospects of the horticulture in both rural and urban areas of the state. In India, by 2050, nearly 900 million people will be living in urban areas. With the expanding urban fringes, more and more rural areas are becoming peri-urban. Manipur being one of the states of India will also have impact of this urbanization. Given the high population pressure, rising food prices and the socio-economic and environmental stresses, especially in the urban areas, meeting the food, nutrition, health and environmental security in the urban and peri-urban areas will be a serious challenge. In this context, an eco-friendly, productive and remunerative Urban and Peri-urban Agriculture (UPA) shall become increasingly important. Hence, the proposed paper is targeted to examine the existing position of horticulture in Manipur with a view to ascertain its growth potential by evaluating prospects with a primary objective of suggesting lines of development in future.

Keywords: Horticulture, Urban, Rural, Constraints, Prospects

### Introduction

Horticulture is the Art, Science, Technology and Business of intensive plant cultivation for human use. Recently, diversification from agriculture activities to horticultural activities has been in the offing since horticulture is important to society in a variety of ways, including the necessity of main source of food and nutrition, ornamentals and aesthetics to the environment and job creation. Horticulture is the area of plant science that caters to the needs of a broad range of people, from the small backyard farmer in the urban area to the large scale producer in the rural area. Horticultural activities make it attractive to people from all walks of life, including those who may not wish to study agriculture or be identified as farmers in the way society defines them, but are willing to grow and care plants. Thus, horticulture industry is making it increasingly easier and more attractive for nonprofessional plant growers to participate in plant culture at various levels and for various needs.

India, with its wide variety of climate and soil is highly favourable for growing large range of horticultural crops such as fruits, vegetables, ornamental plants, medicinal and aromatic plants, spices and plantation like coconut, cashew, cocoa, tea, coffee and rubber. Eventually, the Government of India have identified horticultural crops as a means of diversification for making agriculture more profitable through efficient

---

\*Assistant General Manager, Bharat Sanchar Nigam Limited, Telephone Bhawan, Babupara, Imphal.  
Email:tsmeetei@gmail.com

\*\*Junior Research Fellow, Manipur Institute of Management Studies (MIMS), Manipur University, Canchipur, Imphal. Email:mukhra.kangjam@gmail.com

\*\*\*Professor, Manipur Institute of Management Studies (MIMS), Manipur University, Canchipur, Imphal.  
Email:drwcsingh@gmail.com

use of land, optimum utilization of natural resources (soil, water and environment) and also creating employment for rural masses. When it is about the state of Manipur which is one of the North Eastern states of India, the hills and valleys are situated at different agro climatic conditions which provide good prospects for growing different kinds of sub-tropical and temperate fruits and vegetables. Besides, there is ample scope for bringing more land under cultivation in the hill areas. Even in the plain, soil conditions are conducive to the production of citrus fruits, banana, guava, peaches, apricot, papaya, etc. There is sufficient scope for cultivation of pineapple in the medium high range hills of Manipur. Floriculture is another aspect that is being taken up in Manipur. Landscaping is also another aspect of horticultural activities being a platform for most of the gardening lovers both in rural or urban areas; and this landscaping also provide employment as well. Therefore, horticultural development will be the most authentic, reliable and priority sector for successful economic upliftment of masses especially rural population and self reliant nutrition. Above that in the urban areas too, though the land holdings may be smaller compared to that of the rural areas can take up the horticultural activities as for instance small nurseries can be set up and beautification of the environment could be done through gardening and landscaping architecture. So this study is mainly focusing on the prospects of the rural and urban horticulture in the state for self reliant nutrition, job creation and environment concern.

Horticulture is the science or art of cultivating fruits, vegetables, flowers, or ornamental plants. According to William L. George, Horticulture involves five areas of study. These areas are floriculture (includes production and marketing of floral crops), landscape horticulture (includes production, marketing and maintenance of landscape plants), olericulture (includes production and marketing of vegetables), pomology (includes production and marketing of fruits), and post harvest physiology which involves maintaining quality and preventing spoilage of horticultural crops.

As society evolved, deliberate cultivation of edible plants replaced the less efficient food-gathering habits of primitive societies. The deliberate use of plants by humans for aesthetic and functional purposes has its origin. The Hanging Gardens of Babylon were hailed as one of the Seven Wonders of the World. Agriculture and for other matter horticulture, is therefore, not a modern-day invention but one that continues to be transformed as society advances technology. The foundation of agriculture was built upon by civilization that followed the Egyptians. The Greeks and Romans were next to impact practical agriculture. Records show that the Romans used horticultural practices such as grafting, budding and fertilization which are still in use today.

Modern horticulture continues to seek advances in the way crops and other plants are produced. Plant diversity has increased through advanced breeding practices. Certain institutions of higher learning such as colleges and universities have educational programmes in horticulture for training and conducting research to advance the area of study. Modern horticulture is also a big business which provides self employment for people with wide variety of skills. So, according to George Acquaah when considered from the science and business perspectives, horticulture can more be defined as 'science and art of cultivating, processing, and marketing of fruits, vegetables, nuts and ornamental plants.'

Therefore, horticultural products include all products, raw or processed, that arise from the horticultural industry. Fruits and vegetables are part of everyday meals, including special high-value diets for infants and the elderly. Fruits and vegetables are an important component of traditional food, but are also central to healthy diets of modern urban population. They form the basis of a wide array of processed or partially processed products. Increasingly innovative products use fresh fruits and vegetables in fast foods and components of ready meals. Ornamental plants have high cultural values for people, and urban green is considered an important part of city quality of life now-a-days.

Therefore, horticulture industry has four divisions (Acquaah, 2009) as the figure shown below:

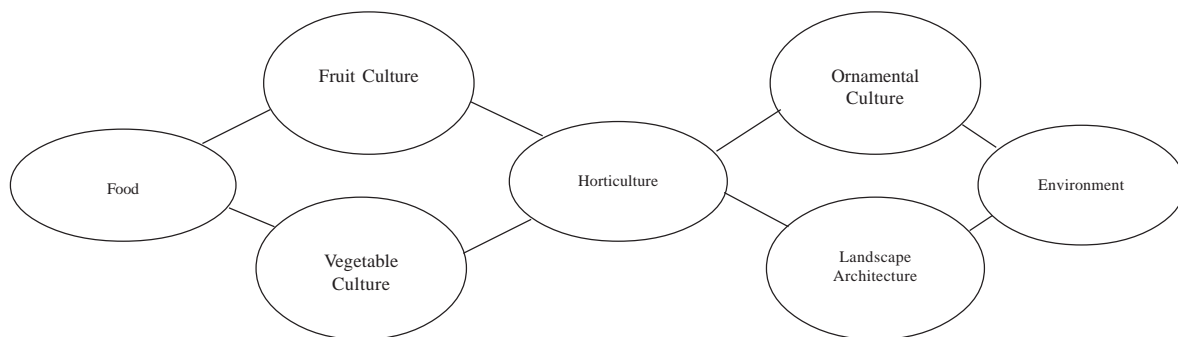


Fig 1: Four divisions of horticulture industry

The figure 1 clearly shows that horticulture has two main goals - to provide food, and to impact the environment. Horticultural activities may be divided into several broad categories based mainly on the kinds of plants involved such as:

**Fruit Culture:** An area of land on which fruit trees are grown in a significant concentration is called an Orchard. Hence, the branch of horticulture involved with the production (growing, harvesting, processing and marketing) of fruit trees (including nuts) is called Pomology.

**Vegetable Culture:** Vegetable production is one of the most popular horticultural activities indulged in by homeowners, often in the backyard or private section of property. The branch of horticulture involved with the production of vegetables is called Olericulture. Vegetables may be harvested and used fresh. However, these are also processed in a variety of ways.

**Ornamental Horticulture:** The production and use of ornamentals is the branch of horticulture generally regarded as Ornamental horticulture. Floriculture is the production and use of flowering plants and one of the area most readily identified with when horticulture is mentioned. The branch of horticulture involved with the production of trees is called Arboriculture.

**Landscape Architecture:** Landscaping is the use of ornamental plants in conjunction with other elements to beautify a given area. The professionals who design such plans are called Landscape Architects. Some landscaping can enhance a property, which has become an integral part of home construction. Commercial facilities and other public areas are also appropriately landscaped. Parks, playgrounds, etc. are examples of public places where ornamental plants are used to enhance the environment aesthetically and make it functional.

**Urban and peri-urban horticulture:** In cities, environmental benefits and synergies can be achieved when horticulture is planned as a part of the urban landscape including safe recycling of solid waste and waste water (Sharholly et al., 2008). Further, trees and other ornamental plants are crucial for sequestration of carbon from atmosphere and play an important role in reducing carbon footprint. Moreover, flowering/foilage plants in the garden not only add beauty but also help to improve the ecosystem. India has responded well to the needs for effective urban and peri-urban horticulture (UPH) with emphasis on green space, green building, development of parks and gardens, and promotion of peri-urban vegetables production, but the integration appears to be poor. The design of urban and peri-urban agriculture (UPA) must include a large component UPH aimed at improving access to food and enhancing the livelihoods of people living in and around cities besides nurturing the environment. UPH is now a necessity rather than a luxury. The government's initiative of peri-urban vegetables production alone is not enough for the huge challenge to be met. This necessitates holistic approach having vertical and horizontal integration of the efforts of all the stakeholders, which should concurrently link all compo-

nents of UPH. Among the various gardening options, terrace gardening, a raised ground space around a dwelling house or on the sides of a hill, forms a link between the house and the rest of the outdoor living space and must, therefore, be designed in harmony with the plan of the house. Roof garden is one of popular alternatives in urban and peri-urban areas, because of the lack of available space on the grounds of a house. Particularly, in the big cities and towns, the only space left for garden enthusiasts is the roof of the house and the balcony. To ensure the success of roof gardening, technical and developmental support is inevitable. Currently, a green space of 20 m<sup>2</sup> park as minimum standard has been suggested. No dwelling should be more than 500 meters away from a green area of at least 6,000 m<sup>2</sup>. Green spaces in urban systems should essentially be developed as networks. There is no definite standard for green space in Indian cities based on scientific data. Therefore, the standard for green space and tree cover in the cities needs to be formulated for meeting the challenges of climate change which is expected to put increasing stress on urban and peri-urban areas. Green cities have become an option to mitigate the impact and adapt to climate change.

#### **Importance of Horticulture:**

- As compared to field crops Horticultural crops give more returns per unit area (more yield in terms of weight and money)
- Horticulture crops are important as their nutritional value is high. Particularly fruits and vegetables provide high amount of vitamins and minerals.
- Horticulture beautifies the surroundings.
- Horticulture crops are suitable for small and marginal farmers.
- The varieties of crops are available in the Horticulture section with wide range of uses.
- Horticultural plants improve environment by reducing pollution, conserves soil and water and improve socio-economic status of the farmer.

#### **Literature Review**

According to George Acquah's study "Horticulture - Principles and Practice" (2009) observed that horticulture has two main goals, (1) to provide food and (2) to impact the environment. As society involved, deliberate cultivation and domestication of edible plants replaces the less efficient food gathering habits of primitive societies. Agriculture, and for the matter horticulture, is therefore not a modern day in venture but one that continues to be transformed as society advances technologically. He further asserted, growing horticultural plants is more production intensive than growing agronomic and forest plants. The returns on investment per unit area of production are also generally higher for horticultural plants.

Denisen (1972) propounded that horticulture is extremely important to our day-to-day life. Nutritionists have discovered basic concerning the relationship of our health and the food we eat. He further stated, "Today we are a much better people than were our ancestors." The knowledge available to us about the kinds of foods, their content of food nutrients, and human requirements enable us to have the best balanced diets known to the world.

Malik (2000) in his book "Horticulture" prompted in USA, 40 percent of the food weight consumed consists of horticulture product. According to the World Health Organisation (WHO) recommends a minimum of 400gm of fruits and vegetables each day for a healthy human diet. This means a demand of 146 kg per head per year and 17.5 million tonnes for a population of 120 million. Comparing it with the present level of production (7.8 million tonnes), there is currently about 10 million tonnes short of fruits vegetables just to provide a balanced diet to the population.

Horticulture became a major industry during the seventeenth century (Funk & Wagnalls, 1988), in a period when the growth of large cities created demand for fruits at an ever-increasing rate. In Europe; the Netherland, Germany, France, Belgium and Great Britain; in the Americas, the United States of America;

in Africa, South Africa; and in Australia, New Zealand and Tasmania are the most advanced countries in the field of modern horticulture. In recent years, Japan, China, and Russia have attended their horticultural crop production (Encyclopedia of America).

In India, the developmental concept of horticulture was introduced quite late. In the 'Indian Horticulture Database 2014' published by National Horticulture Board, Ministry of Agriculture, Government of India, the area under horticultural activities engaged 12.8 Million Ha in 1991-1992 with the production of 96.6 Million MT and in 2013-2014, the area under its use is 24.2 Million Ha with 277.4 Million MT production of horticultural crops. The total production during this period has increased by nearly 2.8 times and corresponding productivity has increased 1.5 times.

According to 'Hand Book on Horticulture Statistics 2014' published by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, percentage share of vegetables production in the total horticulture production is highest compared to other horticulture crops. It implies the necessity of the nutritional values and balance diet to be met by vegetables.

Jugindra (1996) in his book "Vegetable in Manipur" stated that Manipur being endowed with a rich flora comprising fruits plants, flowering trees, herbs, vegetables, spices, distributed through the diverse eco-geographical zone, it is felt that the conservation of these gifted flora for specific zones is a basic need from being extinct. It is also worth mentioning, if some potential plant species are not conserved right now, a day will come that all the plant genetic resources with miraculous properties will be eroded from this Earth, giving a pain to the biotic races. Therefore, an urgent need is felt to explore to the maximum of the vast potential extending to north east region.

Further, according to Christopher (2001) in his book 'Introductory Horticulture', temperature, moisture, light intensity, and length of day, all important factors influencing the plant growth, combine to make up the climate of an area. The possible combinations are numerous. Horticultural activities are successful only when the climatic requirements of a crop are met by natural or artificial mean. In this regards, Manipur is one such region where the climatic conditions for some specific fruits, vegetables, herbs, medicinal plants, flowers etc. are suitable for the cultivation.

The production of horticultural crops are meant to meet the nutritional needs of human which in turn cultivation of horticultural crops helps in augmenting the family income of farmers by way of providing additional employment opportunities to human and animal labour. The activities like digging of pits, filling them, pruning, application of insecticides etc. and marketing operation generate sufficient employment (Swarup & Sikka, 1987). In the economically backward region like Manipur, where rural unemployment and off season underemployment are a big issue, emphasis on horticulture can yield desired results in various directions. Presently, horticulture sector in Manipur remain confined in the backyard. Despite, Manipur is considered as one of the most suitable place for growing many horticulture crops. This sector is not properly flourishing in the state. If potentiality of this sector is properly tapped, farmers both in the hill and the valley will be benefited to a great extent.

Further, according to Ghosh (2012), food processing is becoming increasingly important to help farmers in realizing a better price; it has been identified as a priority sector for bank credit and certain fiscal concessions. Recently, the processing industry has started growing rapidly, aiming to process 7-8% of horticultural commodities. The estimated market potential of processed food in 2015 is reported to be 11 times in fruits and vegetables, compared to the figures for 2003-04, and 4.5 times in spices. Thus, fruits and vegetables serve as a natural source of vitamins and minerals. Flowers add beauty and aesthetic to life. Plantation of crops, trees and shrubs preserve the environmental balance of the nature. Orchards too help in maintaining soil moisture and better utilization of culturable wasteland. Further, newly invented drip irrigation system enhances the tree crops. Besides, their role in developing country like India, both economic and social spheres, for improving income and nutritional status, particularly for rural masses, cannot be overlooked. Thus, horticulture industry has a unique role to play socially,

environmentally and most importantly economically that improvise the economic independence of the rural growers particularly which led to economic empowerment.

### **Significance of the Study**

North Eastern region of India is an industrially backward; there is no visibility of any industry worth mentioning except in Assam. Like other North Eastern states, Manipur is largely isolated from the rest of India. Its economy centres on agriculture and forestry. Most of the people in the region depend on agriculture for their livelihood and people depending on industry are very less as compared to those indulged in agriculture. While going into the bottom, the income that is raised from agriculture is seasonal. So, the farmers and growers of Manipur particularly in the rural areas need to diversify the agricultural crops to horticultural crops since horticultural activities are labour intensive and the products are in demand especially in urban areas for various purposes, may be for daily diet, for food processing, etc. There is need of area expansion for horticultural activities to meet the demand of this products since horticulture is very diverse in its activities, incorporating plants for food (fruits, vegetables, mushrooms, culinary herbs) and non-food crops (flowers, trees & shrubs, turf-grass, hops, grapes, medicinal herbs). It also includes related services in plant conservation, landscape restoration, landscape & garden design/construction/maintenance, horticultural therapy, and much more. This wide range of food, medicinal, environmental, and social products & services are all fundamental to developing and maintaining human health and well-being.

Besides, horticulture is contributing significantly in the society with the creation of job and livelihood to many growers. Thus horticulture is taking a prominent part in economic development for a nation therefore, participation in economic activities increases, which brought them economic independence.

### **Objectives of the study**

Following are the objectives of the research.

- To examine the existing position of horticulture in Manipur.
- To study the prospects of horticultural activities in urban and rural areas of Manipur.
- To draw possible suggestions from the findings.

### **Methodology**

The research design is exploratory research design and it has been conducted with the view of gaining familiarity and the in depth understanding of the concerned topic. The operational areas of the study covered the nine districts of Manipur where the horticultural growers mainly inhabited. The four valley districts are: Imphal East, Imphal West, Thoubal and Bishnupur. The five hill districts include: Ukhrul, Chandel, Churachandpur, Senapati and Tamenglong. The study covered 884 progressive farmers or growers who are indulging in different types of horticultural activities in the whole of the state. The study is basically based on primary data. The primary data is collected through questionnaire; and several structured and unstructured personal interviews are conducted to elicit the firsthand information relating to the theme of the study. The whole analysis for this present study depends solely on primary data collected from the potential growers while taking the sample. However, secondary data is also collected from various sources like journals, books, manuals and reports of the State Government for literature part.

### **Discussion and Findings**

Socio-demographically, the study examined the current existing position of the horticultural development in Manipur from different aspects like sex, age, religion, caste, occupation, number of family members involved in the horticultural activities, and income earned from the activities.



Table 1. Sex-wise distribution

Sex	No. of cases	%
Male	642	72.6
Female	242	27.4
Total	884	100.0

Sex-wise out of the total growers participated in the study, it was found that 72.6% of the growers were male and 27.4% were female growers indulged with the horticultural activities. This implies that male growers are mainly involved in cultivation of horticultural crops; however, female counterparts are also interested in these activities though the figure is lesser.

Table 2. Age-wise distribution

Age (Yrs.)	No. of cases	%
20-25	9	1.0
25-30	31	3.5
30-35	66	7.5
35-40	102	11.5
40-45	158	17.9
45-50	145	16.4
50-55	156	17.6
55-60	108	12.2
60-65	66	7.5
65-70	27	3.1
70-75	16	1.8
Total	884	100.0

Source : Primary data

According to the age-group, 51.9% of the total growers who were 40 to 55 years of age were actively involved with the cultivation of horticultural crops. Though, 11.5% and 12.2% were the percentages of the horticultural growers who were 35 to 40 years of age and 55 to 60 years of age respectively.

Table 3. Caste-wise distribution

Caste	No. of cases	%
General	285	32.2
OBC	79	8.9
ST	501	56.7
SC	19	2.1
Total	884	100.0

Source : Primary data

Table 4. Religion-wise distribution

Religion	No. of cases	%
Hindu	331	37.4
Muslim	7	.8
Christian	508	57.5
Meiteism	38	4.3
Total	884	100.0

Source : Primary data

Caste-wise, 56.7% of the participants (horticultural growers) in the study were schedule tribe since most of the population is being inhabited by schedule tribes in the hills areas of Manipur and they are mostly Christians by religion. 32.2% of the growers belonged to general category, 8.9% belonged to Other

Backward Class, and 2.1% belonged to the Schedule Caste. Again it was found that of the total growers, 57.5% were Christians, 37.4% Hindu, 4.3% Meiteism and 0.8% Muslims.

Occupationally, the study found that most (95.1%) of the participants were the farmers who have taken up the horticultural activities in the state. Out of the total, 1.2% growers were those who were employed either in Government Agencies or in private organizations but they grow horticultural crops or ornamentals in their interest and as their passion. 1.0% growers were the housewife engaging in the cultivation of fruits and vegetables to contribute their family's livelihood. 1.4% growers were those who were self employed and as one of the ventures they take up this occupation. Finally, 1.2% of the total growers were those who were unemployed which implied that they chose horticultural activities for their livelihood while searching for the source of employment.

Table 5. Occupation-wise distribution

Occupation	No. of cases	%
Farmer	841	95.1
Employee	11	1.2
Housewife	9	1.0
Self-Employee	12	1.4
Unemployed	11	1.2
Total	884	100.0

Source : Primary data

Table 6. No. of family member-wise distribution

No. of family members	No. of cases	%
1 – 5	422	47.7
6 – 10	442	50.0
11 & above	20	2.3
Total	884	100.0

Source : Primary data

47.7% of the growers had 1- 5family members engaged in the horticultural activities and half of the sample i.e. 50% represented 6 - 10 members of the family working together in the farm whereas, 2.3% represented that of the 11 and above family members group. Well, this shows that the involvement and participation of the family members engaged in these activities is just because it is labour intensive activities.

Table 7. Annual income from horticulture-wise distribution

Annual income from horticulture (Rs.)	No. of cases	%
Below 25,000	145	16.4
25,000-50,000	196	22.2
50,000-1,00,000	282	31.9
1,00,000-2,00,000	216	24.4
2,00,000 & above	45	5.1
Total	884	100.0

Source : Primary data

On account of annual income from the horticultural activities, 5.1% of the sample said that they had the annual income of INR 2 lakhs and above, 24.4% as that of INR 1lakh to 2 lakhs annual income and 31.9% as that of INR 50,000 to 1 lakh annual income from horticulture. This information is quite impressive as it shows that with their hardship and intensive work out, they are gaining some income out of it. Majority of the growers in the rural sector have not realized the vast potential for the development of

horticulture which will equally remunerative and socially beneficial as the study observed that 31.7% respondents strongly agree that income from horticultural activities fulfilled their financial needs. However only 2.9% respondents strongly disagree on this point as well as 19.1% were unable to agree or disagree on the fulfilment of their financial needs. 55.8% of the respondents strongly agree and 26.4% simply agree that the return on investment from the horticultural activities is sufficient and reasonable. On account of the horticultural activities and its prospects in Manipur, certain statements were asked to the growers and the findings were as follows:

65.3% growers out of the total respondents strongly believed and agreed that in Manipur, the future of horticultural activities is bright and it has great prospects environmentally, economically, and socially (healthy and nutritional food provision). 23.8% also simply agreed to this statement. 7.2% growers were not able to agree or disagree. 1.6% disagreed and 2.1% strongly disagreed to the view; the reason might be that they had negative experience or unawareness or lack of information about the facilities, new technologies, etc.

Table 8. Satisfaction of financial needs through horticulture income

Statement 1: Income from horticulture activities fulfills all your financial needs	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Total
Responses	280	211	169	198	26	884
%	31.7%	23.9%	19.1%	22.4%	2.9%	100.0%

Source : Primary data

Table 9. Returns on investment at Horticultural activities

Statement 2: The returns on investment at Horticultural activities are reasonable so far	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Total
Responses	493	233	67	73	18	884
%	55.8%	26.4%	7.6%	8.3%	2.0%	100.0%

Source : Primary data

Table 10. Prospect of horticulture activities in Manipur

Statement 3: The prospect of horticulture activities in Manipur is bright.	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Total
Responses	577	210	64	14	19	884
%	65.3%	23.8%	7.2%	1.6%	2.1%	100.0%

Source : Primary data

Table 11. Recognition of the importance of horticulture activities

Statement 4: People in Manipur recognize the importance of horticulture activities.	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Total
Responses	577	163	86	39	19	884
%	65.3%	18.4%	9.7%	4.4%	2.1%	100.0%

Source : Primary data

Table 12. Continuance of horticulture activities in future

Statement 5: It will be good for us to remain in this business/ activity in future too.	Strongly Agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Total
Responses	629	173	58	5	19	884
%	71.2%	19.6%	6.6%	0.6%	2.1%	100.0%

Source : Primary data

Table 13. Calculated Chi Square test values

S1	S2	S3	S4	S5
3.27746E-10	0.8268197	0.167177	0.565784	0.026499

Source : Primary data

Table 14. Support from the State Horticulture Department

Do you get support from the State Horticulture Department?	No	Yes	Total
Total	656	228	884
%	74.2%	25.8%	100.0%

Source : Primary data

The views on the importance and recognition of horticultural activities in the state were also outstanding as 65.3% growers strongly agreed and 18.4% growers agreed the statement. Definitely this shows a remarkable behaviour in them in terms of satisfaction that they are horticultural growers and being recognized by the general public for their contribution to the society. Then what about the remaining growers i.e. 9.7% who did not agree or disagree, 4.4% who disagreed and 2.1% growers who strongly disagreed. It may be indicating that there is a need to motivate them. They might have been looked down by the people as mere farmers. However, since more than 50% of the growers believed that there is huge prospect for them, 71.2% growers strongly believed and wanted to remain in these activities in future and they had the opinion that there is scope for them whether in rural where the land holdings for horticultural activities are large or in the urban where cultivation of flowers and ornamental plants can be grown to appreciate the aesthetics of the urban areas. The opinions of the growers were tested for significant difference between the observed and expected responses. The calculated values of chi square for statements 1 to 5 are 3.27746E-10, 0.8268197, 0.167177, 0.565784 and 0.026499. The table for the statements with 4 degrees of freedom at 5% level of significance is 0.711. Since statements 1, 3, 4 and 5s chi square value is less than the table value, the null hypothesis is accepted meaning the observed and expected inferences from the respondents are not significantly different. Except in the case of statement 4 viz., people in Manipur recognise the importance of horticulture activities is found to be significantly different in terms of observed and expected inferences.

Further, it was observed that out of the total sample, only 25.8% growers in the study received support and assistance from the State Horticulture Department. Giving training for latest developments, assistance of technology, equipments of growing and harvesting, infrastructural facilities like transport and water supply, distributing high yielding seeds, fertilizers and organic farming, assistance for subsidy and loan facilities and assistance for marketing and selling of the horticultural products are some of the support provision of the Department. About 74.2% growers are running their activities without the

support and assistance of the department since they are aware that as a grower or farmer they can fulfil their livelihood out of this occupation and definitely they are also aware that there is demand for fresh fruits and vegetables in the urban areas as well as people love ornamental flowers and plants for their garden. It is observed that improved production technologies developed at Research Stations have not been transferred to the field due to lack of sufficient extension program and infrastructure. The required organizational support is highly inadequate despite major strengthening of the research system through National Research Centre (NRC).

Maximum of the growers (74.9%) sell their products to the local markets. 2.7% growers sell their products through the cooperative societies, 23.2% growers sell it to the big markets in the urban areas and towns and 36.2% growers' products are picked by the contract buyers from the farm directly. However, perishability of horticulture product alone contributes heavy losses after harvest of these crops. According to the Swaminathan Committee (1985), post harvest handling account for 20 to 40 percent losses at different stages, but in the case of Manipur, the losses are higher.

So, most of the growers are inhabited at the rural areas though the percentage of urban growers are lesser which is because of the lesser land cultivated areas. However, due to certain projects taken up by the State Government as well as construction of the certain markets and structures at some areas of the rural areas, some part of the rural areas are in the process of transformation from rural to peri-urban areas. This means that in Manipur with the Imphal as its capital city along with other town, the demand for healthy and nutritive foods whether fresh or processed and other horticultural crops are increasing.

### **Suggestions**

Presently, horticulture sector in Manipur remain confined in the backyard. Despite, Manipur is considered as one of the most suitable place for growing many horticulture crops; this sector is not properly flourishing in the state. If potentiality of this sector is properly tapped, farmers both in the hill and the valley will be benefited to a great extent. Therefore, the following suggestions have been made for the development of horticulture from the grass root level.

-Since horticulture sector is highly technology driven it is necessary to upgrade the skill of the farmer, field functionaries as well. Therefore, there is an urgent need to establish training centre for horticulture in rural and urban areas of every district of Manipur.

-Strong motivation needs to be built in the growers' mind and soul and their works must be encouraged to recognize their contribution.

-Cooperative Societies needs to be formulated like community based organizations, self-help groups etc. to enhance the rural population capable of planning, promotion, and implementing their own course of activities.

-Improved modern inputs should be made available by giving subsidy to upgrade relevant skill among growers.

-Market infrastructure and related promotional measures need to be strengthened to easily access for the horticultural farms and dispose their product with desire return.

-The urban public must also be made aware that the environments in urban areas are affected because of pollution. So, the need of the hour is implementation of urban and peri-urban horticulture.

-Finally, since Manipur has a vast potential for exploitation of horticulture crops, Government Agencies and the local Non-Government Organizations must collaborate with the aim to encourage and implement the various plan and projects.

### **Conclusions**

Diversification towards horticulture sector for food security in nutritive value provides ample employment opportunity and improves the productivity of land in the development process of the people