

ISSN 0973-3914

# RESEARCH JOURNAL OF SOCIAL AND LIFE SCIENCES

HALF YEARLY, BILINGUAL (English/Hindi)

A REGISTERED REVIEWED/REFEREED RESEARCH JOURNAL  
Indexed & Listed at: Ulrich's International Periodicals Directory®,  
ProQuest, U.S.A (Title Id: 715205)

Volume- XXVIII-III    English Edition    Year- 14    June, 2019

UGC  
Journal No. 40942  
Impact Factor 3.928



**JOURNAL OF**

**Centre for Research Studies**

**Rewa-486001 (M.P.) India**

Registered under M.P. Society Registration Act,  
1973, Reg. No. 1802, Year-1997

[www.researchjournal.in](http://www.researchjournal.in)

RNI NO. MP BIL 01034/12/1/2005-TC

ISSN 0973-3914

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**Chief Editor**

**Prof. Braj Gopal**

Honoured with Prestigious Bhartendu Harishchand Award

profbrajgopal@gmail.com

**Honorary Editor**

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Honored with Prestigious Pt. G.B. Pant Award Government of India 1997,

1998 and Bhartendu Harishchand Award

Professor, Department of Sociology & Social Work

Institute for Excellence in Higher Education

Government T. R. S. College, Rewa (M.P.)

akhileshtrscollege@gmail.com

**Dr. Sandhya Shukla**

Professor and Head

Department of Political Science

Institute for Excellence in Higher Education

Government T. R. S. College, Rewa (M.P.)

drsandhyatrs@gmail.com

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shuklagayatri@gmail.com

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**Publisher- Gayatri Publications**

Rewa (M.P.)

**Laser Composing- Arvind Vyas**

Rewa (M.P.)

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**Editorial Office**

**S.S.D.-4, "Gokul", Vindhya Vihar Colony, A.G. College, Road,  
opposite Durga Mandir, Rewa- 486001 (M.P.)**

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## *Editorial*

We are living in a digital age at the moment, where information is transmitted at lightning speed. The scope of discussion in the city-to-village crossings has now become endless. The misuse of this growing scope is now being done to see and read unwanted content, now our society has gradually started to take 'love instead of porn'. Impatience, lack of direct communication, social crimes are increasing. Thoughtless messages are carried forward, in which sometimes child theft and other religious, political or planned hysterical rumors are spreading, which makes the crowd furious and go off without a thought. The biggest reason for this is the smartphone that has made its place in every palm, the disharmony spread on social media. It is noteworthy that most of the rumors like child theft spread on WhatsApp. Have you noticed why the administration first places a ban on the Internet when there is tension in an area. Many such incidents have come to light that such inflammatory messages and rumors only become the hero of the crowd through WhatsApp or any social media platform. These social messaging apps, especially videos and hate messages on WhatsApp, are forwarded without knowing the truth of the incident.

At present, a horrendous threat has emerged in India too, "Moblinking" means a mob attack by a mob. Recently there have been incidents of mob lynching in many places across the country. Due to false rumors, many people have been killed by the mob. After all, how suddenly so many people gather together for one purpose. The psychology of the crowd has been a small part of social science. This is a strange and old method, whose relevance has come to an end after stability in society and trust in law and order. The discussion on the psychology of mob began as a different phenomenon when we considered the mob of the French Revolution or the racial mob of the Ku Klux Klan as an example. Then the old issue of killing a black person by a mob of white people was a topic of discussion in the psychology of the crowd. The incidents of frequent mob lynchings in India in the last few years are forcing us to wonder whether the 'anarchy of mobocracy' is prevailing in our country now ..? In the name of saving the cow, Asha Khan and Rakbar Khan (whose death actually happened in police custody?) Are killed in the name of Cow, and then in the absence of Goumant, Mohamed Akhilak is killed in Noida, sometimes love-jihad So, due to the rumor of 'child thieves' on the social media, the crowd is coming out to make 'justice' on the lines of the decision on the spot.

The major incident of mobs lining was brought out in Maharashtra, where on 1 July 2018, the crowd beat and beaten five people in Ranpada village of Dhule. These people were accused of being child thieves. On 9 June 2018, two youths were beaten to death by a mob after a rumor of a child thief gang spread on social media in a remote area of Assam's Karbi Anglong

district. On April 28, 2018, a Hindi-speaking laborer was beaten to death by a Hindi-speaking laborer in Vellore district, in June, 2018, local people in Chennai's Tenampet area badly beat two migrant laborers in the suspicion of being a child thief. On 15 June 2018, a software engineer was allegedly beaten to death by a mob and 3 people were seriously injured by a mob on WhatsApp in Muraki of Bidar district, Karnataka. On July 21, Khetaram Bhil was allegedly beaten to death by 12 men on charges of illicit relations with a Muslim woman in Barmer district of Rajasthan, bordering Pakistan. On 24 July 2018 In Jalpaiguri district of Bengal, the crowd allegedly attacked four women and left two of them suspected of being a thief and disarmed two of them. There were 2 such incidents in the same month. In 2017 itself, 16-year-old Junaid was killed in Ballabgarh, Haryana, in a minor dispute over a seat in a train. On 22 June 2017, security officer in Kashmir Mohammad Ayub Pandit was beaten to death by the local people because he was taking photographs of people outside the mosque.

Overall, a lot of such incidents have occurred in the whole of India in this decade. The Supreme Court has strongly reprimanded the government for failing to curb the rampant mob and rumors circulating on social media, calling it a 'sinister act of monocracy' on the cases that are continuously coming up.

Another sad aspect of these incidents is that political and social organizations take up these incidents more according to their 'facilities'. In such a situation, his opposition is more 'political' rather than real, which also makes it light.

The country's largest court is also very strict about incidents of mob lynching. During the trial of Tehsin Poonawala case, the Supreme Court has issued the guidelines for the central government and state governments to prevent the occurrence of lobbying. During this time the Supreme Court had said that it is the duty of the government to protect the life of every citizen. Article 21 of the constitution gives every citizen the right to life and without the process established by law, one's life cannot be taken away. This means that if someone has committed a crime, he will be punished only by bringing it under the purview of the law.



**Professor Akhilesh Shukla**

Editor

01 June 2019



**Professor Braj Gopal**

Chief Editor

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## **Socio-Political Implication of BJP Regime in Assam: People's Perception**

\* Dipendra Kumar Khanal

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***Abstract-** Political regime is about the rule of those political parties which are committed to any particular ideology it may be either the left wing or communist parties or right wing political parties. In this paper the Regime has been understood as combination of multiple dimensions of rule by a party or a leadership. The BJP regime in Assam refers to socio-political, economic and cultural influences on the state and society. The basic objective of this paper is to analyse the socio political implications of the BJP regime in Assam. Analyse has been done on the basis of information collected through the primary sources. The BJP regime has various implications on the society and politics of Assam. In order to know the ground reality, the views of ruling as well opposition parties, various organisations and academicians have been taken into consideration. To get better understanding of the present scenario interview has been conducted with various sections of the people in Assam.*

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### **Key Words- Socio-Political, Implications, BJP Regime, Assam**

**Introductions:** Political regime is about the rule of those political parties which are committed to any particular ideology it may be either the left wing or communist parties or right wing political parties. According to Cambridge English dictionary “Regime means a particular government or a system or method of government”. In this paper the Regime has been understood as combination of multiple dimensions of rule by a party or a leadership. The BJP regime in Assam refers to socio-political, economic and cultural influences on the state and society. Here the BJP regime has been understood as how the BJP was committed to the ideology of “Hindutva” that run the government and how it functioned and the way it influenced the socio-political, economic and cultural aspects of the society as part of its ideology. In Assam prior to the BJP rule, INC ruled for 15 years but it was never considered a regime. Because Congress, a centrist party has no commitment to any particular ideology, so they neither propagated neither any ideology nor they tried to influence the society economically and socially the way BJP has done recently. Therefore it is very important to study the BJP regime in Assam.

In this paper the socio political implications of the BJP regime in Assam has been discussed on the basis of information collected through the primary

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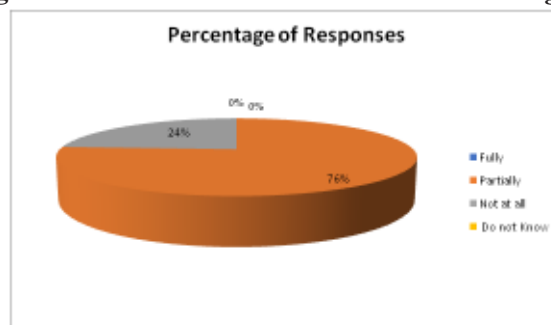
\* Research Scholar, Department of Political Science, Mizoram University, Aizawl

sources. The BJP government has completed three years of its rule and has adopted many policies and programmes. The BJP regime has various implications on the society and politics of Assam. In order to know the ground reality, the views of opposition parties, various organisations and academicians have been taken into consideration. In order to get better understanding of the present scenario interview has been conducted with various sections of the people in Assam. Total 100 respondents have been selected on the basis of simple random sampling to collect primary data. Interviews were conducted with a structured questionnaire with the selected respondents. The respondents were chosen from various disciplines which comprise of Academicians, Political leaders, Lawyers, Research scholars and farmers. The views and responses of the selected respondents have been analysed to get a comprehensive picture of the situation. Among them 20 each from academicians, political leaders, lawyers, Research scholars and Tea farmers were selected. Out of 20 respondents, 10 were male and 10 were female. Academicians were selected from Gauhati University, Tezpur University, Dibrugarh University, Assam University and also from various colleges of Assam. Politicians and youth leaders from the INC, BJP, AGP, AIUDF and CPI (M) were interviewed. Lawyers were selected from Gauhati High courts and various Districts courts. Research scholars from Gauhati University, Tezpur University, Dibrugarh University and Assam University were also interviewed. Farmers were selected from various regions of the state that is four sub regions of Assam which covers all the districts (South Assam, Upper Assam, North Assam and Lower Assam).

The responses of the interviewed people constitute major part of the paper. The questions were asked on the socio-political implications of the BJP regime. To the queries regarding the knowledge of rise, growth and performance of the BJP, it has been noticed that respondents were aware of the situation and they have responded thoroughly which is full of information's and facts.

#### **Questions asked to respondents on various issues related to the Bharatiya Janata Party regime in Assam.**

**Figure 4.1: Ethnic Polarisation in the BJP regime**

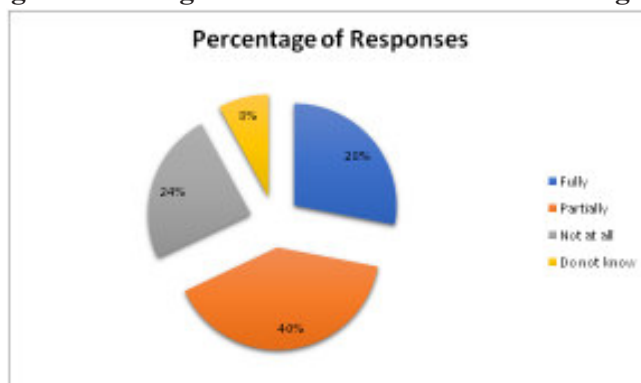


Source: Data collected from my field study.

To the queries related to the ethnic polarisation in the BJP regime, out of the total respondents 76% respondents believes that ethnic polarisation has been partially noticed. On the contrary other 24% respondents replied that in the BJP regime there is no ethnic polarisation at all.

As per as ethnic polarisation is concerned small communities are already organised and working for their progress and development at their own level. Regarding ethnic polarisation statuesque has been maintained in the present political scenario. Though the ethnic feeling is there but at present, it is not visible as per with religious and linguistic polarisation. But statehood demand by the Bodo peoples is at the peak, and from Assam to Delhi they are protesting for the demand of Bodoland. But they are yet to get any concrete result.

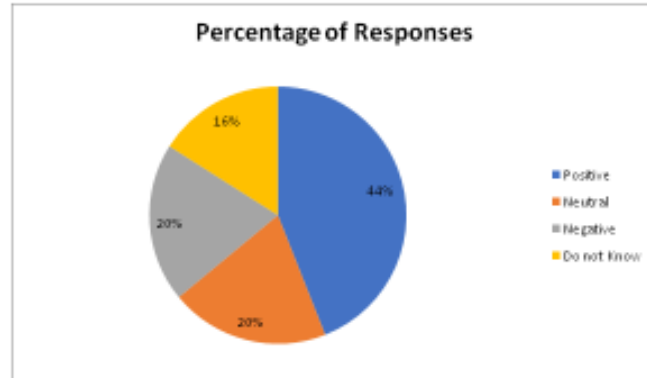
**Figure 4.2: Linguistic Polarisation in the BJP Regime**



Source: Data collected from my field study.

In reference to the questions of Linguistic polarisation in the BJP regime, 28 % respondent out of the total respondents replied that it is fully polarised in the linguistic line. Another 40% respondents believes that it is only partially polarised. However 24 % of the respondents are of the view that there is no linguistic polarisation in the BJP regime. Out of the total respondents eight percent respondents do not have any knowledge about this.

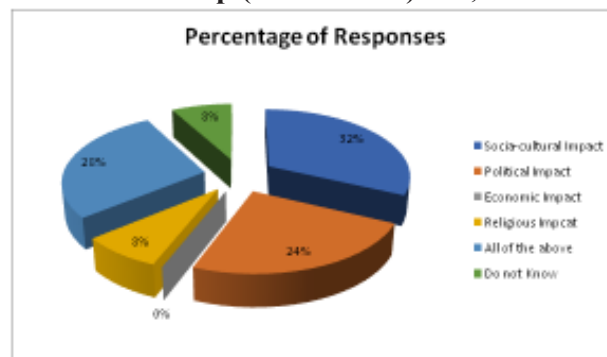
In recent times, because of the Citizenship (Amendment) Bill 2016, the linguistic polarisation between Assamese and Bengali speaking people is at the highest level after the “Bhasha Andolan” or Linguistic movement of 1960s. (In Assam, the anti foreigners movement was against the Illegal immigration of Bangladeshis.) But the BJP government’s decision to provide citizenship to Hindu Bangladeshis has divided Bangladeshis into Hindu and Muslims. Before the Citizenship bill came into limelight, people were opposition and protesting against the Bangladeshis as a whole. But after this bill came into focus, protest movements by various organisations shifted against Hindu Bangladeshis only, which has at some point turned anti Bengali. And, the reactions of this has been seen in the Bengali dominated region of Barak Valley.

**Figure 4.3: Approach of the BJP Government in NRC Upgradation**

Source: Data collected from my field study.

Keeping in view the recent issue and controversy of NRC upgradation in Assam, a question was asked to know the approach of BJP government in NRC upgradation. As a response to this question, 44% respondents stated that the approach of the BJP government towards NRC upgradation was positive. Other 20% respondents said that BJP was taking a neutral stand in this issue. Whereas, according to 20% respondents, the BJP governments approach towards the NRC upgradation is negative. The rest of the respondents, that is 16% does not have any knowledge about this.

In the beginning the BJP has a positive stand towards the NRC, even in the 2014 Lok Sabha elections the then BJPs prime ministerial candidate Narendra Modi has announced that after the Lok Sabha elections results the Bangladeshis must go from Assam. But the proposed Citizenship (Amendment) bill, 2016 is against the basic spirit and objective of the NRC upgradation and detention of foreigners. After the NRC upgradation and publication of draft NRC, BJPs state president, ministers and other leaders are openly criticising the process of NRC. They are stating that many genuine Indians names are missed and lakhs of foreigners are successful in enrolling their names in the NRC.

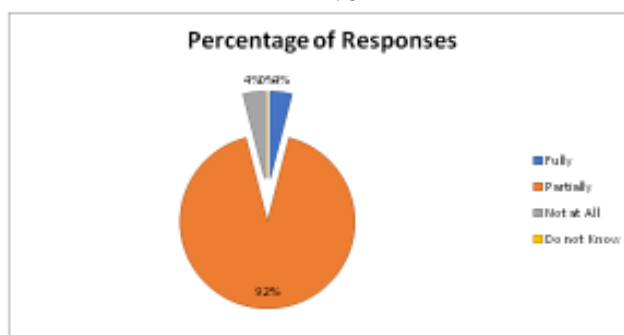
**Figure 4.4: Impact of the BJP Government Supporting the Citizenship (amendment) Bill, 2016**

Source: Data collected from my field study.

The Citizenship (amendment) Bill, 2016 remained a matter of controversy in Assam from couple of months. To the queries related to the impact of BJP government support for the Citizenship (amendment) Bill in the society and politics of Assam 32% of the total respondents are of the view that it has socio-cultural impact. Out of the total respondents 24 % replied that the amendment bill has serious political impact. However eight percent respondents think that it has religious impact. It is important to note here that 28% of the respondents think that it will have socio-cultural, political, economic and religious impacts. On the other hand eight percent respondents have no knowledge about the bill.

Regarding Citizenship (amendment) Bill, 2016 the state government is facing the widespread protest from various organisations across Assam and particularly in the Brahmaputra valley. People have a fear in their mind that if the bill becomes an act, then lakhs of Hindu Bangladeshis will get a permission to enter Assam and that will lead to “Tripura like situation” where the indigenous people will be outnumbered by the immigrants. If they become majority political power will also be taken away by the immigrants. The immigration of the Bangladeshis will also hamper the language and culture of the people of Assam. It will also have rampant impact on socio-political, economic and cultural aspect of the state and its people.

**Figure 4.5: The Success of the BJP Government in Anti Corruption Drive**



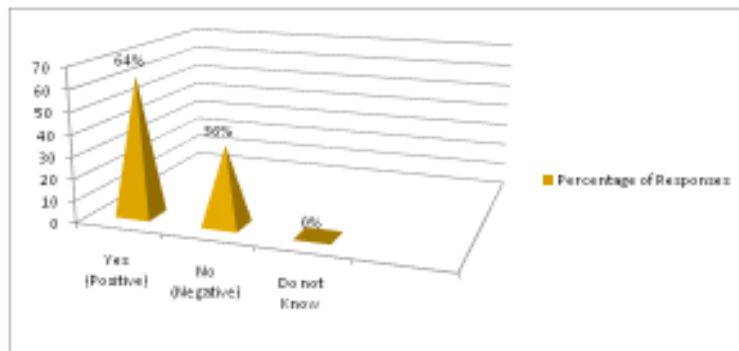
Source: Data collected from my field study.

The BJP government has taken many new initiatives and anti corruption drive is prominent. Questions were asked in order to get peoples perspective regarding the BJP governments anti corruption drive. The study has revealed that 92% respondents viewed BJP governments anti corruption drive as a partially successful move. On the other hand four percent respondents think that it is fully successful. However another four percent finds anti corruption drive not at all successful.

The BJP government came into the power as people were fed up with the corruption during the Congress rule. Soon after acquiring power BJP led government initiated investigation and start taking action against the APSC

scandal. The BJP government was successful in sending then APSC chairman Rakesh Paul behind the bars. After him many civil service, police service and allied service officials who got job by using unfair means have also been arrested. Some of the arrested officials are dismissed but many officials are yet to be caught. Apart from APSC scandal few other corrupt officials were also sent to jail but corruption in the state is widespread and many areas are still untouched. Majority of the respondent agreed that anti corruption drive of the state government have been partially successful. But the government should work sincerely to make the state corruption free.

**Figure 4.6 : The BJP Government's Population Control Policy**

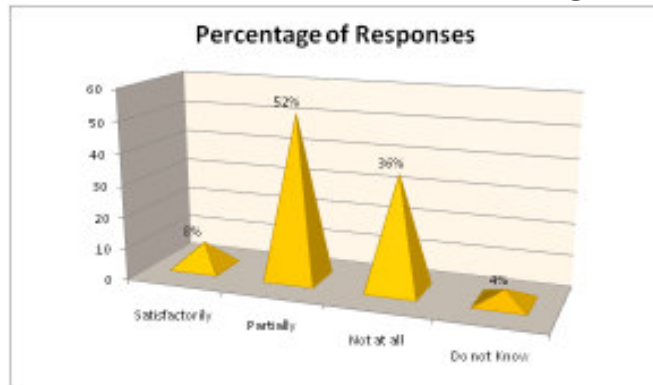


Source: Data collected from myfield study.

To the queries on the BJP government's population control policy, 64% of the total respondents agreed that it is a positive initiative. Whereas 36% respondents said that population control policy is a negative and bias move. BJP,s population control policy has also become an issue of controversy.

Population Control policy of the BJP govt is one of the most controversial policy. Majority of the people are happy with the policy and regards this move of the government as a positive move and need of the hour. The population explosion has become a major problem in Assam which has led to unemployment and other problems. Therefore the population control policy have been largely welcomed. This policy has put certain conditions for getting jobs and also to contest panchayat elections. According to the policy a person having more than two children is not eligible to apply for jobs and contest the panchayat elections. Even though the policy have been criticised by some section of the people.

**Figure 4.7: The BJP Government Success in Tackling the Bodo Issue**

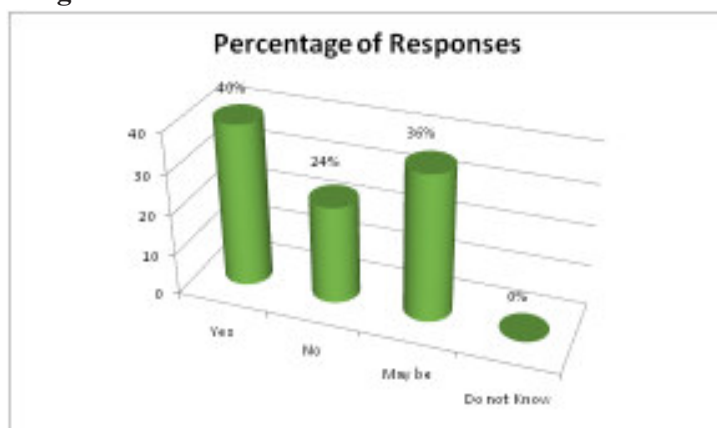


Source: Data collected from my field study.

On the question of BJP governments tackling the issues of Bodo tribes, out of the total respondents, 52% respondents are of the view that the government is partially successful in tackling the Bodo issue. On the contrary, 36% respondents believe that BJP government is not at all successful in handling the issue. However, eight percent respondent seems satisfied with the government’s way of tackling the Bodo issue.

The BJP has promised to resolve the Bodo issue during 2014 Lok Sabha election and it also repeated the promise in 2016 assembly elections. Various rounds of discussions are going on between the Centre and NDFB (progressive) and also between the Centre and ABSU. But any concrete solution of the Bodo issue or the formation of Bodoland is yet to become materialised. Bodoland movement under the leadership of ABSU is continuously going on. According to a secret report from Delhi the long standing demand for separate Bodoland has been rejected.

**Figure 4.8: Feeling of Cultural Imposition on Assamese Society under the BJP Regime**



Source: Data collected from my field study.

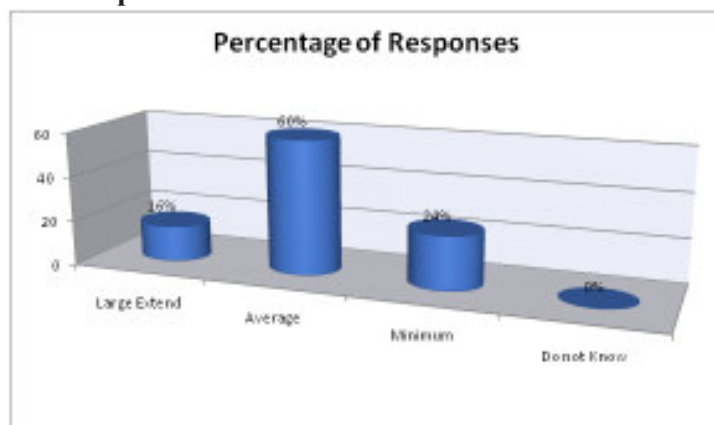
Question was also asked on much talked issue of cultural imposition on Assamese society following the BJP regime. Regarding this issue 40% of the



total respondents said that there is a feeling of cultural imposition under the BJP regime. On the other hand 36% respondents replied that there may be a feeling of cultural imposition. However 24% respondent denied any feeling of cultural imposition on Assamese society under the BJP regime.

Following the BJP regime, a strong feeling of cultural imposition upon the Assamese society has been felt by many. Programmes such as Namami Brahmaputra have resemblance with Namami Gange. It is seen by a section of people of Assam as an imposition of North Indian culture upon Assam. Traditionally there is no custom of “Brahmputra Arati” like that of “Ganga Arati”. The state governments sponsored “Namami Brahmaputra” which cost crores of rupees is also regarded as cultural imposition by the BJP led government. Therefore a majority of the respondents also agreed to it.

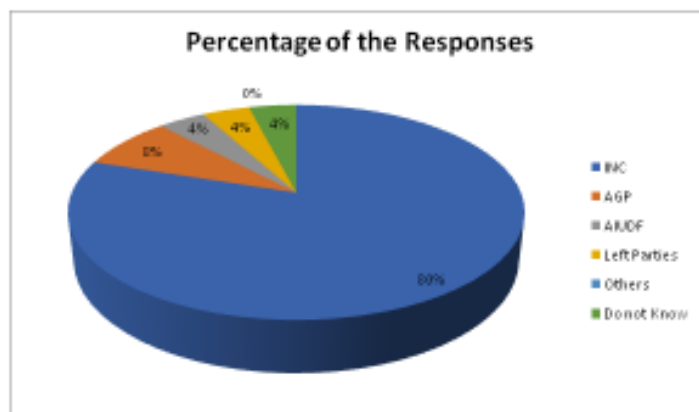
**Figure 4.9: Improvement of Law and Order under the BJP Regime**



Source: Data collected from my field study.

On the questions of Law and order under the BJP regime, 60% of the total respondents are of the view that it is average. On the contrary, 24% respondents feel that there is no improvement in the law and order situation under the BJP regime. But on the other hand 16% respondents believe that under the BJP regime law and order has been improved to a large extend. From the responses, it can be said that in last three years of the BJP regime law and order situation has been improved. As in the BJP rule no major ethnic or communal riots has been noticed compare to that of the previous Congress government. But the killing of five innocent people by the United Liberation Front of Assam (Independent) in the Tinsukia district has raised question on the law and order situation in the state.

**Figure 4.10: Political Party that is Considered the Main Contender of the BJP**



Source: Data collected from my field study.

Regarding the question of main contender or opposition party of the BJP, it is important to note that 80% of the total respondent said that it is the Indian National Congress (INC). Other 8% respondents believe it is the regional AGP, alliance partner of the BJP is the main contender. Another four percent of the respondents replied that it is the Left parties. While four percent respondents also believe the AIUDF is the main opposition. Rest four percent said that they do not know about this.

From the respondents it can be said that INC is regarded as the main contender of the BJP in Assam. From the organisational strength and present in the Assembly and Lok Sabha also the Congress party is regarded as the second largest party in Assam. Moreover Congress party's organisation as well as its frontal organisations like Indian Youth Congress and National Students Union of India (NSUI) are still regarded as stronger than other political parties in Assam. These frontal organisations help the Congress party to connect with the new blood or the young people, where parties like Asom Gana Parishad (AGP) are miserably failed.

#### **Conclusion:**

The above discussions underline the perception of the people regarding the performance of the BJP led Assam government. The study also highlighted the socio political implications of the BJP regime in Assam. From the study it can be said that the activities of the BJP regime are pro Hindutva. The BJP's stand on NRC upgradation and Citizenship (Amendment) Bill, 2016 has labelled the party as a communally biased. Because of this factor the BJP is failed to gain the trust of the religious minority groups. Though the intention of the govt to carry out eviction was not bad but in the absence of proper planning the whole process went into vein and people suffered a lot.

The making compulsory of the Sanskrit language and celebration of Namami Brahmaputra are regarded as the cultural imposition of the BJP

regime by the Assamese people at large. After so much of protest against the citizenship amendment bill BJP is not taking any action. This made people feel that BJP is so concerned about Hindutva that they are overlooking the interest of the people of Assam. Moreover the role of the Chief minister in this regard is seen very minimal. Not much efforts have been taken to consider people's demand. Neither much action has been seen to gain the confidence of the people.

It has been revealed by the study that ethnic polarisation has also been noticed. At present because of the proposed Citizenship (Amendment) Bill 2016, the linguistic polarisation between Assamese and Bengali speaking people is at the highest level. The approach of the BJP government in the NRC upgradation, was initially regarded as positive, but after the publication of the second draft BJP's stand regarding NRC has also changed. The study highlighted that there is a sense of dissatisfaction among the majority of the Assamese people regarding the Citizenship (Amendment) Bill, 2016, and wide protest has also been seen. The study highlighted that majority of respondents believes that corruption has been minimised either fully or partially. The reform in the APSC is successful in creating this impression. The study also shows that BJP government's population policy is regarded as a positive move by maximum respondents. As the population explosion has become a major problem in Assam which has led to unemployment and other problems related with this. Regarding the Bodo issue the study highlights that 60% respondents believes that govt is tackling it satisfactorily. The study reveals that there is a feeling of cultural imposition on Assamese society following the BJP regime exists as maximum of the respondents somehow agree with this. The events like Namami Brahmaputra contributed to this feeling of the people. The study shows that more than 75% respondents believe that law and order under the BJP regime has improved as the state is free from riots under this government. From the study it can be also said that INC is regarded as the main contender of the BJP in Assam, as 80% respondents opt for it. The organisational strength and present in the Assembly and Lok Sabha of the Congress party also supports this opinion.

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## **Democratic Decentralization and Rural People: Identifying the issues and potentialities with special reference to Notun Tekela Chirring Mottock Gaon, Dibrugarh**

\* Satyadeep Lahkar

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*Abstract-* Doctrine of democratic decentralization and its practice occupies a central place in the discourse of the constitutional governance and democracy in India, the largest democracy of the globe. In simple sense, the doctrine of decentralization implies the theme of empowering the common people to take active participation in the existing mode of governance and administration and such concept and practices are of highly importance in a country like India. Moreover, the doctrine of democratic decentralization would only be fruitful if such doctrines functions in an inclusive way. It means that the very process democratic decentralization must be practiced by the all sections of the society specially those of rural areas. Hence, the present paper aims to throw some lights on the issues pertaining to the notion of democratic decentralization among the natives of Notun Tekela Chirring Mottock Gaon, Dibrugarh.

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### **Key Words- Democratic Decentralization, Rural People, Issues**

**Objective:** The major objective of this paper is to access how far the spirit of democratic decentralization has been materialized among the residents of the said village of Dibrugarh along with highlighting the major issues pertaining to implementation of the same and to prescribe some measures for acceleration of democratic decentralization among the natives of the said village.

**Research Methodology:** The methodology of this paper is quantitative in nature based on field study made by the researcher. However different books, journals and articles are consulted and different websites are visited while preparing the article.

**Discussion:** It is well known that the doctrine of democratic decentralization has been able to occupy a distinct place in the discourse of Constitutional democracy and governance in India. Democratic decentralization can be considered as process of delegation of power and authority to lower or grass root levels.<sup>1</sup> Democratic decentralization, which is often called as political decentralization too implies the transfer of policy and legislative power to the

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\* Former M.Phil Scholar, Department of Political Science, Dibrugarh University.

local elected bodies.<sup>2</sup> In a country like India, the notion of democratic decentralization plays a vital role in making people socio-politically empowered. Importantly, the 73<sup>rd</sup> and 74<sup>th</sup> amendment of the constitution and subsequent developments across the country have created a new horizon in the greater realm of democratic decentralization of the country at large. Local governance arrangement made under these constitutional amendments has often been considered as the third pillar of Indian Federalism which indicates decentralization of power to the bottom level.<sup>3</sup> In this connection, it is worthwhile to mention the fact that democratic decentralization is often considered as a prerequisite element for bringing all round development to the rural areas. Parallelly, democratic decentralization is highly acclaimed as the institutions of grass root politics.<sup>4</sup> Hence, attempts have been made here to unfold some major dynamics regarding democratic decentralization in the rural areas of the Dibrugarh district of the state of Assam in the lights of the Notun Tekela Chirring Mottock Gaon, Dibrugarh. Fallled under Rajabheta Gaon Panchayat, Dibrugarh this village is located approximately 5 kms from the heart of the Dibrugarh town. The total population of this village is at around 2000-2500 and most of the natives of this village are the follower of the *Mayamora* sect of the *Vishnavism*. Occupationally, most of the villagers are associated with fishery and allied business. For the convenience of the study, 50 respondents have been randomly selected for interview and the age group and educational qualifications of the respondents are as mentioned below:

**Table No. 1**

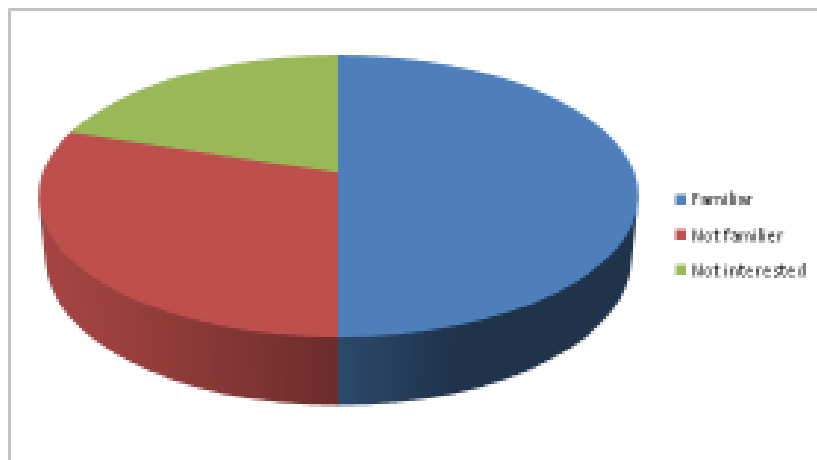
Sl. No.	Age Group	Number of Respondents	SL No	Educational Qualifications	Number of Respondents
1	25-35	20	1	Up to HSLC	21
2	35-45	16	2	Up to HS	18
3	45-55	14	3	Up to Graduation	11

(Table 1 denotes Age group and Educational qualification of the respondents)

In this study the researcher has interacted to the respondents to unfold their views on the notion of democratic decentralization and the reactions on the part of the respondents have been mixed in nature. For instance, some respondents were found indifferent to the issues like democratic decentralization and people's participation in government considering these issues as "*dangor manuhor kotha*" (Meaning in English- Issues of influential ones). Importantly such reactions were mostly from the elderly respondents. However, the researcher has also found some reactions from some respondents having adequate knowledge on the trends like democratic decentralization and people's perception on state administration. In this connection, the view of Arjun Das (name changed), a youngster of the village who holds a post – graduate diploma in Rural Development to his credit deserves special mention.

This respondent has confidently opined that though democratic decentralization is highly essential for bringing all-round development of rural people but negligence and lack of willingness is the root cause of the people's negative attitude towards democratic decentralization. Similarly, another resident of the village who was anonymous to be named opined that monopolization of local politics in the few hands often lead towards the development of the sense of negligence towards democratic decentralization.

Figure 1  
Respondents view on decentralizing of governance

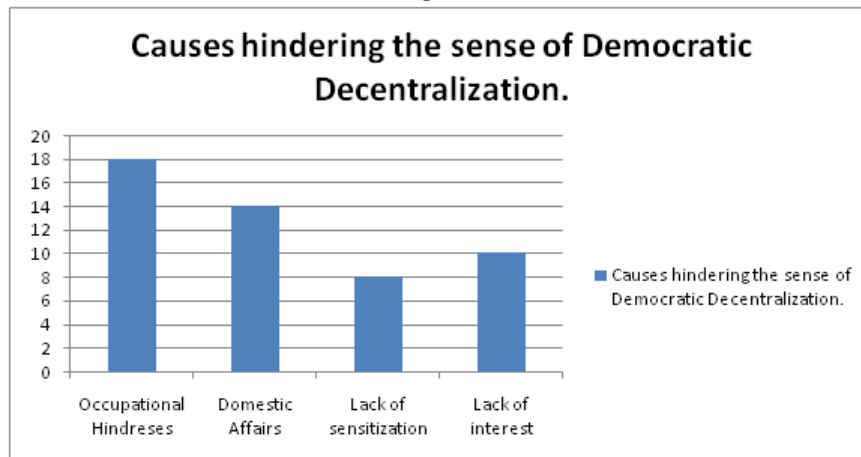


(Figure 1 depicts respondents how far respondents are familiar with the notion of democratic decentralization)

Here, it has been found by the researcher that most of the respondents are familiar with the notion of democratic decentralization. Some respondents expressed their view on the panchayat elections previously held and different dynamics pertaining to the panchayat election. Similarly some respondents have also expressed their view and grievances regarding the different government sponsored developmental schemes. Importantly, the fact found by the researcher is that the responder's who are more familiar or enthusiastic with the notion of governance; electoral politics are mostly from the young generation. Interestingly, an enthusiastic respondent belonging to the age group of 25-35 has vehemently opined that by virtue of technological revolution (indicating his smart phone with his account in a social media) they are familiar with the contemporary political scenario of the country and the trends of democratic decentralization i.e. the issues pertaining to panchayatiraj system prevailing in other parts of the country. So the researcher found that the succeeding generation's view towards democratic decentralization is affirmative to a satisfactory extent and the role of the means of modern

technology is paramount here.

Figure2



(Figure 2 denotes the causes affecting the sense of Democratic Decentralization among the natives of the said village)

Apart from the above mentioned issues the researcher tried to find out the causes hindering the sense of democratic decentralization among the natives of the village. In this regards the investigator made queries to the respondents and different factors have been found responsible for the lack of spirit and the practice of democratic decentralization among the residents of the village. Importantly, some respondents specially the male ones have opined that they have to keeps their selves busy with work specially the works like fishery and others to run their family. So they are unable to concentrate the issues like democratic decentralization and the way of participation in the state affairs. Similarly, most of the females of the village opined that they have to busy with domestic affairs and so they are unable to involve directly in the decentralization process of governance. In other words most of the respondents have been found acknowledging the fact that day to day involvement in domestic or occupational affairs often impacts their direct involvement in the process or practices of democratic decentralization at large. Although the incumbent panchayat member of the respective gaon panchayat herself is women but most of the female respondents are found to be reluctant in democratic and electoral affairs. Moreover, the investigator also found that there is proper degree of sensitization among the natives of the village which resulted in the lack of interest among the masses. In short, it has been found by the researcher that there are numerous causes which are inimical to the process of implementing democratic decentralization among the common rural people including that of the concerned village.

**Recommendations:** The present study shows that there are some causes hindering the very process of implementing the spirit or doctrine of democratic decentralization in the rural areas of the country in general and in particular to

Assam. So there is an urgent need to boost the spirit of democratic decentralization among the rural peoples not only for making the rural people familiar with the government apparatus but also for ensuring their inclusive development too. Importantly, it is often argued that the system of democratic decentralization introduced in India did not develop people's power in true sense.<sup>5</sup> However, democratic decentralization and people's participation in administration are often considered as the both parts of the same coin so different methods of ensuring peoples participation must be promoted for implementation of democratic decentralization among the rural people. In the connection of the present study, following recommendations have been prescribed for smooth and transparent implementation of the spirit of democratic decentralization among the rural people at large.

- **Role of State mechanism:** For proper implementation of the doctrine of democratic decentralization the state mechanism has to dedicate itself wholeheartedly. Different state policies, schemes should be made transparent and easily assessable for the rural masses so that such moves build confidence among the rural people.
- **Role of different Non Government Organization:** Apart from government move, Non Government Organization (NGO's) can also play a vital role in bringing democratic decentralization in rural areas. NGO's can take several initiatives and sensitization drives for ensuring democratic decentralization in rural areas.
- **Role of Political Parties:** Role of Political parties in democratic decentralization is paramount. Different political parties whether they are national or regional can make the common masses of rural areas to familiar with the doctrine of democratic decentralization. Moreover, political parties can give the basic platform to the common masses of rural areas to involve in decentralized democratic processes in a direct manner.
- **Role of Mass Media:** It can be considered another vital measure for bringing democratic decentralization among the rural peoples. Mass media through constructive way can sensitize the rural people regarding the dynamics of electoral politics and state mechanism.
- **Use of Modern Technology:** It has been mentioned earlier that how use of modern technological equipments has sensitized the young generation of the rural areas regarding existing scenario of state mechanism and electoral politics. So modern technological tools to be used as per as possible to implement the spirit of democratic decentralization in rural areas.

Apart from the above mentioned measures, incorporation of adequate lessons on this topic in curriculum of different levels of education, constructive role of elected representatives specially those of rural areas and of the civil servants are also paramount for materializing the tenet of democratic decentralization in the rural areas of a country like India, the largest democratic dispensation of the globe.



So above are some measures by virtue of which the process of ensuring democratic decentralization in rural areas can be accelerated to a great extent.

**Conclusion:** In conclusion, it can be remarked that democratic decentralization is a vital issue in a country like India not only for ensuring democratic values among the rural masses but also for bringing inclusive development for them. Moreover, there might be some hindrances in this regards but such hindrances needs to be sorted out through various measures for ensuring the basic doctrine of democratic decentralization at large.

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## **Significance of Palliative Care in India - An Analysis**

\* Karavi Barman

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***Abstract-** Every state wants to develop in present times. The process of development is hardly possible without the progress and development of a human being. In the International Conventions and development, the third generation rights are recognized as Human Rights. Such human right includes the right to food and health. Therefore, good health as well as dignity is needed for the development of a state as it is the mandate of a welfare State. Palliative care plays a vital role in development of health of the people and hence its awareness seems to be a must in contemporary times. This is the crux of the present research paper. Rights are recognized as Human Rights. Such human right includes the right to food and health. Therefore, good health as well as dignity is needed for the development of a state as it is the mandate of a welfare State. Palliative care plays a vital role in development of health of the people and hence its awareness seems to be a must in contemporary times. This is the crux of the present research paper.*

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### **Key Words- Development, Progress, Human**

Palliative care is a specialized medical care for people living with a serious illness. The goal of palliative care is to improve the quality of life for both the patient and the family. All human beings are entitled to attain the highest enjoyment of good health conducive to a dignified life. Formulation of human policies, implementation of health policies and adoption of certain legal instruments might help one to pursue the reduction of good health.<sup>1</sup>

It lay emphasis on the predominance of nature and intended action of development and implementation of the progress and policies concerning primary health care around the universe. The Constitutional framers imposed heavy obligation upon the state for securing justice. It shall include social as well as economic justice. Though the right to health is not provided as a fundamental right in the Constitution, it directs the state to take measures to improve the conditions of health care of the people. The Preamble has been amplified in the Directive Principles of State Policy.

### **Palliative care in light of human rights perspective :**

Human rights cannot practically exist if people do not develop a sense of compassion among each other. It cannot exist barely in books. Mere slogans on protection of rights would hardly bear any fruit. So, every human being

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\* Assistant Professor, N.E.F Law College, Guwahati

should practically preserve life rather than focusing on the laws in the statute books. The ideas and opinions expressed in Palliative care booklets should be made available for the masses. Moreover, there is need for legislative response in India pertaining to the necessity of palliative care. Two questions that arise in human rights are content and viability. An adequate comparison is drawn by Jeremy Bentham between the human rights in legislated form and in actual existence. It is pertinent to note that there are several ways of safeguarding and promoting human rights other than legislation. These different routes are considerably complementary. Example, for effective enforcement of the human rights laws, public monitoring and pressure can make a considerable difference. The ethics of human rights can be made more effective through a variety of inter-related instruments of versatility of ways and means.<sup>2</sup>

**Analysis of a case study done by the researcher:**

The researcher has informed opinion regarding the summary of the case studied and perceived. While conducting the empirical study the researcher met various doctors from different field and has opined on importance of the developments of palliative care centers in India.

**Case Study :**

Mr. X hailed from an urban middle class socio-economic status. He was a businessman and happily married with his wife who was a government employee and three daughters. He gradually expanded his business and had good will in the society. At the age of forty two, he felt ill and despite much treatment could not be recovered. He was diagnosed with skepticism. He was then taken to the hospital immediately. His infection aggravated. He could not be recovered properly even after prescribing the doses. The doctor detected kidney failure.

He was also suffering from trecheostomy (it means failure of breathing capacity). In order to enable the patient to breath, a hole was made in the throat which had to be kept openly for twenty four hours. He was put in a ventilator so that the muscle and air is in contact to keep him alive. But, the infection aggravated due to the presence of the bacteria in the air. Antibiotics were pushed for the bacteria culture program.

But, the motor neurons already died. So, there was no fighting capacity in the patient and even the antibiotics did not respond. The wife did not lose hope and she along with one of the brothers of the patient flew to Nutech Medi World, Delhi. However, the doctors declared there that there was no instant cure. Since he was in ventilator, the blood pressure fluctuated and so the CRP ( C Reactive Protein) was used to check whether there was body inflammation. His position was stable there but the capacity of the lungs decreased due to the reason of being in a portable ventilator.

Consequently, he had fever. He had no sense and the intestinal movement stopped. The doctor detected that the root cause of the symptoms might be that the motor neurone disease could not stop illness. The doctors ultimately

declared that there was no further treatment and the family members were waiting only for the heart beat to stop and he was in ventilator for three months and a half and ultimately died.

The researcher had an occasion to meet one of their daughters studying medicine, who wanted to find out the root cause of her father's illness and by approaching various experts came to a conclusion that it is auto immune (that kills the cells of the body on own) Auto immune is a kind of nerve impulse, i.e. to pass through one nerve to another there is a gap and to fill up the gap, there requires a neurotransmitter which almost kills a patient.

The researcher has examined the report of the patient and for the better understanding of the report has consulted the doctor who was mainly looking into the case. The doctor clearly stated that there was no scope for recovery and the medicines that were being administered in those cases could only slow down the progress of the disease. While interrogating the daughter, she said that there were no uniform standards to regulate control over the decisions of the doctors. Otherwise, it could have curtailed the exploitative tendencies in the medical practitioners and hospitals in future.

The burning issues that can be raised in this case-

1. Availability of medical facilities in a government hospital
2. The economic factor
3. The social factor
4. Failure of all medical treatment
5. Availability of hospital beds in a government hospital
6. Proper information to the family members by the medical practitioner examining the patient
7. Support of family members
8. Stigma and discrimination in all facets of life
9. Feeling of helplessness and depression in the patient and the bereaved family
10. Funding Source

Sanctity of life should be re-defined from the patient's perspective of human rights and personal autonomy. However, self-determination is also the underlying factor. The researcher opines that total ignorance of these factors would certainly lead to infringement of human rights. Moreover, no constitution can be greater than humanity.

Of course, despite the other factors, emotional factor cannot be ignored but the circumstances warrants that the doctrine of necessity has to be considered. Moreover, it cannot be denied that with brain dead, the biological death of the patient occurs even though he may be physically kept alive.

The researcher has observed that in most of the cases, the doctors in clear terms states that the family members should take the patient home as there is no hope. Then, another major problem which cannot be undermined is that the private hospitals might not disclose about the real situation of the

patient. Then, what about the expenses of the treatment? They are not going to treat the patient with minimum expenses nor is it possible for the family members to provide care-givers to the patient on a permanent note.

Palliative Care is suggested by the researcher instead of continuing aggressive treatment in intensive care unit thereby not making the patient totally aloof during his last days and leaving him at the mercy of futile treatment, increasing the hospital bills. The importance of palliative care can be stressed for the people of low-income or lower middle-income countries because of its disease-specific treatment.

The phrase 'life-threatening' is to be used keeping in mind that the term 'life' is used in the broader sense of the term and not just existence. It is pertinent to note that palliative care is especially for cancer patients and persons with terminal illness. Right from the moment any chronic disease or advanced sickness is detected, palliative care shall form the core of care plan.

Palliative care comes into operation when there are no options for cure. Families and patients are referred to palliative care centers in most cases when all treatments are exhausted. Care can improve the inner spirits in the person though cannot completely heal the sufferings.

This is why, probably, people associate it with end-of-life. This is not only a vast misrepresentation of palliative care but it is also a deterrent to people accessing it in a timely manner. It is pertinent to note that Kerala has had a head start in relation to the rest of the country in terms of palliative care services and policy. Till date the model in Kerala is not replicated anywhere in India.

**Observations:**

1. Ninety nine percent of the population that strive for palliative care does not get the minimum care due to lack of awareness.
2. The marginalized – children, women and the elderly, people with stigmatizing diseases like HIV – are uncared.
3. Paradoxically, the rich and the affluent go to corporate hospitals, most of which have no pain relief programs or medicines like morphine. Therefore, palliative care centers are recommended by the researcher.

**Conclusion:**

Palliative Care is of course, so very pertinent and it must be properly administered and euthanasia in passive form should be accepted only as a last resort when all the other mechanism including the palliative care answers in negative. The palliative center is indulged in rendering service to number of patients. They are rendering great service to humanity. The programs and workshops are also conducted to disseminate the need of such centers for the welfare of the people. The researcher happened to attend one of the workshops in this context. It was organized in Dr. B.Barooah hospital. The researcher is of the view that adequate training would help them learn new therapies for the patients.

The care-takers of palliative centers regret the fact that the law is only for rich and lack of awareness is making its accessibility difficult. The palliative care centers are working to meet the needs of the patients like medical care, nursing, social and spiritual care. The researcher opines that the number of palliative care centers should be increased and the state should provide grants to these centers for effective functioning. Standardization of the Palliative care is a must and the government should focus on this issue to achieve the mandate of a welfare state.

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**A village festival brings the social cohesion,  
tranquility and liberal attitudes in the Society  
(A Study on Panchadevata Mela-festival in Rajamayong  
Village in the District of Morigaon, Assam)**

\* Guneswar Deka

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***Abstract-** Religious life of Raja-Mayong is related to certain rights, festivals, and practices of traditional institution like - magic, tantrism, temples, shrines, monasteries, namghars and Sattras. It controls the behaviour of the groups of the religious sect of Raja-Mayong village. Every caste and community of Raja-Mayong has certain taboos and religious sanctions which are to be obeyed by the villagers. The festival is marked by full public participation and is continuing till date in Raja Mayong. This "Pancha Devata" fair has inculcated social cohesion, consensus, fraternity and religious tolerance in the present society.*

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**Key Words-** Rights, Festivals, Traditional institution, magic, tantrism, temples, shrines, monasteries, namghars and Sattras.

**Significance:** The ancient history of Raja-Mayong shows that there were well-organized socio-cultural institutions in Rajamayong, which continued for generations. The significance of the study lies on its attempt to discuss the "Pancha Devata" festival and behavior of the people of Mayong towards the nation building. It is also a traditional education that upholds the social unity and integrity of the nation.

**Background:** Raja-Mayong, a village in the district of Morigaon lies at a distance of 40 km., to the east from the district headquarter and 30 km, to the west from the city of Guwahati via Chandrapur on the South bank of the Brahmaputra. It is situated between 26<sup>0</sup>1'5" North latitude and 92<sup>0</sup>6'4" East longitudes. The area of the Village is 2.35 sq. km. The literacy of the Village is 89% percentage. The village is connected to Guwahati via Chandrapur and to different towns of the eastern part of Morigaon and Nagaon district such as Morigaon and Jagiroad by Motorable roads. Raja-Mayong is an important bus stoppage for almost all the passenger-carrying buses from Morigaon and Guwahati and from Chamata National Highway Stoppage Via Kamapur road. In the months of July and August, the buses cannot ply due to flood. During this period Raja-Mayong village is connected by at least one trip of (Bhoot-bhooti) motored boat to Jhargaon every day.

Raja-Mayong is situated in a picturesque surrounding beautified by several

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\* Head of the Department of Political Science, Mayong Anchalik College (Assam)

numbers of small hills and hillocks towards the north, the east and the southwest of the village. Each hill or hillock towards the northern boundary of village has a name of its own with a rich heritage of shrine and sculptures. The rivers, Sonai and Pakaria flow from the east to northwest of the village. On the extreme south, the Kalong River flows from the northeast towards the west up to the confluence of Brahmaputra. Pabitora, a Wild life Sanctuary, declared in 1987, with the world's highest density of single-horned Rhinoceros along with varieties of other animals and various native and migratory birds is situated on the south.<sup>1</sup> Almost all the sides of the village is surrounded by paddy fields and water bodies and swamps. These swamps are believed to be abandoned course of the Brahmaputra.

“Raja-Mayong” is traditionally known as “Mayang”. Mayang is a Sanskrit term which implies the “Yoni” or “Prakriti” or “Mahamayang”. This term “Mayang” is also found in the *Dasham* i.e. the tenth canto of the *Bhagawata* and the twelfth canto of the *Srimad Bhagabata* and the “Gita” and the last part of the “*Bhahma Samhita*”, This proves that “Mayang” is the Prime “deity” over the nature, Demigods and Goddesses.

Magic and Tantrism flourished in the Raja-Mayong village in medieval period and its tantric activities were patronised by the king of Raja-Mayong. The survey report says that the people of Raja-Mayong like the tantric traditions and it is still survived in few families. One of the reasons perhaps why the tantric tradition thus still survived in Raja-Mayong is that it came under British hegemony rather late and the village is much remote from the Headquarters of the district of Nagaon, Darrang and Kamrup. This is why the villagers of Raja-Mayong are closely related to the rites of tantric and magical practices.

#### **Rajaghariya Goid :**

The Raja-Mayong village has a place in the history of Assam from quite early days. The history of Mayong is almost synonymous to the history of the Eastern Kamrupa. Eastern Kamrupa extended upto Raha-Barapujia and the present district of Morigaon in medieval period.<sup>4</sup>

According to the genealogy of the Kings maintained in the family of the king, which is known as the Raja Ghariya Goid, the kings of present dynasty of the kings of Raja-Mayong have been ruling the little kingdom of Mayong since 1538 AD. Prior to that, the rulers of the Pal dynasty ruled the Mayong area.<sup>5</sup>

Svarachcha Chandra Singha, the third son of former king of Muhit Singha, ruled the kingdom of Mayong from 1590 AD to 1615 AD. His period of governance was a golden time of the Mayong kingdom. He extended the boundary of the kingdom. He was the maker of the fortune of the Mayong kingdom. A large number of Shrines and Monasteries had been established during his reign. It is said that the worshipping of the “Pancha Devata” the five sole deities of the universe and the fair, popularly known as *Mela Utsav* coinciding it, began during his reign.<sup>6</sup>



He went on a Pilgrimage to Koch Behar (Nabadvipa) to bring the images of “Pancha Devata”. Initially he brought the image of Basundeva (Krishna) of “Salagrama”, for the royal adoration and other two idols for the respective royal “Medhis”. He started the yearly Royal worship of the “Pancha Devata” during his reign. He proclaimed that every subjects of the kingdom of Mayong would follow the rites of the “Five deities (Pancha Devata)”; otherwise, their family would be cursed by the five deities.

The “Pancha Devata” festival is celebrated under the auspices of the royal family. It is celebrated for three days viz-4, 5 and 6th day of Bohag in the month of April. First day, the 4th Bohag, is used for the divine bathing of the Salagramas, representing the five deities and a “Raj-Darbar” is held for general discussion on the festival as well as the appointment of new Medhi in case of demise of any Medhi. Traditionally, the deities are bathed by the royal priests. But when the Brahmin families became extinct as they did not have any issue, Brahmins were invited from outside the kingdom for this purpose. Now-a-days, the king, himself serve the ritual bathing of the deities on the 4th day of Bohag and the service of the Brahmin priest is no longer utilized.

**The process of Royal festival:** The worship of Basudeva implies the Panchadevata or the respective Devatas, which is the essential part of the adoration of the Basudeva. The idols of Panchadevata (five deities) of Raja-Mayong were brought from Kochbehar in 1590A.D. by the great king, Sarachcha Chandra Sinha. Firstly, it was started with only three idols of Basudeva; Sambhu or Shiva and Maya or Gauri. After that Ranjit Sinha, added the other two deities of Brahma and Ram and coined the name of “Panchadevata”.

This “Pancha-Devata” worship has been prevailing in Assam since time immemorial. Though it mentions the five deities, in practice many deities of the Hindu pantheon are included. At the top Lord Vishnu; Gauri, Brahma, Surya, Shiva, Lakshmi, Saraswati, the earth, Indra, Ananta, Agni, Dikpal, Astabasu, eleven Rudras and the ten avataras are worshiped with the rites and after these, adoration of Basudeva begins and then Hari Kirtan, i.e. the glories of Krishna are chanted. According to the rites, Pancha Devata are viz. Shiva or Sambhu, Gauri or Yogamaya, Brahma or Surjya, Rama and Basudeva.

In the first week of Bohag (On 4th, 5th and 6th day), four deities (Gossains) are brought with the four royal Medhis to the gate of the royal Temple of “Basudeva” of the Mayong kingdom. On the fourth day of the month of Bohag, the office bearers of the royal family, the Dekaraja, Bishayas, Medhis, Pators, Senapatis, the royal Priest and messengers also remain present there. They are felicitated with the sacred “Sarai” consisting of earthen lamp, incense, Ghat, i.e. an earthen jar with neck (sacred waster) & big musical drums (Bardhol). Thereafter, the king proclaims that they have to go to two other places, namely, Hatimuria and Burha-Mayong on the next two days.<sup>7</sup> At one time the king of Mayong had his “*pam*” i.e. agricultural farms, at

these places for which the procession was led to these places.

On the next day i.e. the fifth day of the month of Bohag, the important portfolio holders like the Deka Raja, the Brahmin, the Pators, the Bishaya, the Bayan, the Bangthai (Commander in chief) the Tamuli, the Maloibaria, the Thakuria remain present in front of the king's Mansion. As soon as they arrive there, the Medhi brings the garland and Brahmins distribute it according to the directions of the king. Thereafter, the king ascends on "Dola" and starts the procession of the festival to the "Hatimuriya" village. The other Bishoyas of the *than* of Bamun Gossain ritually welcome the king and Gossains. After these, the king takes the Royal seat on a particular rock known as the Dhaphkota rock, and the others take their respective seats. As the king takes his seat, the traditional artists and dancers of the Bangthai family start their dance to the tune of a musical instrument called the "Kali". The Brahmins distribute garlands once again. After the end of traditional dance, all respectable people chant "Harikirtan" i.e. the glories of the God. After this, the day long programme ends and they return home.

'On the sixth day of Bohag' - the important Bishayas mentioned above, come again, to front of the king's palace and take out the procession to "Burhamayong" which lies about at the distance of about 3 k.ms. from Raja-Mayong. The itinerary of the procession is same as that of the previous day. They sit on their respective seats when they arrive at Burhamayong village which used to be the residence of the king in the past.

People thronged the road to witness the procession from Raja-Mayong to Burhamayong. Remaining members of the family offer the sacred 'sarai', 'lamp', betel nut, leaf, garland, gamocha, cheleng. A gamocha or cheleng is laid along the street in front of the Royal procession. It is believed that, laying a gamocha to be stepped by the procession wards off diseases and misfortune. Besides these, the people of Mayong bow down in front of the gossain and the king. The people of the royal procession pay obeisance to the Kachaikhaiti than of Raja-Mayong and Ma Kamakhya than situated in the Mayong hill.

On the way of return, they come to the place "Kathpara" located in the north side of the village of Burhamayong, the king offers the awards to the members of the Bangthai clan. At every prescribed place of festival, the people of the Royal Procession chant the name of "Pancha-Devata" as – *Jay, Mayongor Pancho Devota, Chintakoriye; Jayo, Mayongor Bhagavatee, Kachaikhaiti, Burhiai, Kamakhya-Devi, Chintakorie, Om Hari, Om Rama!*<sup>8</sup>

"The Karbi Bishayas and dancers people give a full scream in a graceful manner on the last day in front of the king :-

*oi somalo, somalo oi, Damahi Bikang, (dance)*

*(we have entered, entered by dancing)*

*Damahi Dam (sing)*

*(we have arrived, arrived by singing)*

**Gar Bhangar Utsav:** (breaking of embankment),

After the returning of the Royal procession, all the people assemble in the precincts of the Royal Temple. Before entering the Temple, a traditional rite is performed by the people on this auspicious occasion. It is said that this ceremony in commemoration of Krishna's return from Ghunucha. The story runs that once, Lord Krishna went out on a procession to the city of "Ghunucha" where the divine consort of Krishna resided and he stayed there for at least seven days. This is the ceremonial day of returning. So the supporters of Goddess Lakshmi make a strong Bamboo-Fencing to impede the army accompanying the Lord Krishna as he lied to his legitimate wife, Lakshmi. Finally, the King's side, that is, the members of the procession representing the side of Lord Krishna pays an amount of three hundred rupees to appease the barricade holders. After that, Basudeva enters into the Royal Temple and take Prasada that is, the sacramental food is offered to a deity and the royal festival comes to an end.<sup>9</sup>

There were four families of Royal Priests viz. that of 1. Hara Chandra Sharma 2. Goja Kanta Sharma 3. Santadhan Sharma and Gopal Chandra Sharma. They had been settled in Mayong at the village of Hatimuria to worship the five deities. There were at least 21 families of Brahmins at Hatimuria in the past for which, the place is still known as Bamun-Chuburi. There is an image of Bongshi Gopal of pure copper in the temple at Hatimuria which was worshiped by the Priests.

#### **Changes:**

Though the worship of "pancha-Devata" is a traditional one, it has changed along with time and now it is modern festival fully participated by the people of Mayong. The Royal system of Koch dynasty ensures the participation of all sections of the people of the society of the area in the administration. Even, the representatives of lower caste get a Royal administrative portfolio in administration. This is totally different from the administrative system of the Ahom kings.

This shift of the tradition of bathing the icons by the king himself instead of Brahmin priests is a noteworthy change. It is mandatory according to Brahminical rites to bathe the salagrama by a Brahmin priest. But in Raja-Mayong a total of eight salagramas are bathed by the non Brahmin king and it has been an accepted practice. The King of Mayong, Ghanakanta Sinha is a Bhajaniya Vaishnava of the Damodariya sect i.e. a person who has attained a high position in the Bhakti cult, and has crossed the age of 90. He has been continuing this practice for quite a considerable time. The role of the Brahmins in performing the worship of "Panchadevata" has totally done away with. Even the *nirmalya* i.e. the sacred ablation is also given by the Medhies as appointed by the king.

#### **Active participation of people of Mayong:**

The Royal procession includes people of all castes and communities such as the Koch, Nath, Karbi, Tribal, Keot, Hira, Dom, etc. They bow down

their heads in front of the five deities and the king of Raja-Mayong. Traditionally the Royal procession is started as soon as the king ascended on *Dola* i.e. a palanquin. After independence, the king gave up the practice of riding a palanquin and began walking in the procession. Of course, now a day the king rides on a car or auto-rickshaw because of his old age.

The village musicians take active part in the worship of “pancha-Devata”. The drummers who play the big drums called the Bar-Dhol, the player of Kali, a traditional reed trumpet and the player of the Mridanga, a percussion instrument, the singers of the devotional songs known as the kirtan, all accompany the procession and perform through the streets.<sup>10</sup>

Now a day, this ceremony has emerged as a major social institution in Raja-Mayong. The important personalities are invited to join in the festival. Among others it is attended by the Deputy Commissioner of the district of Morigaon, Ministers of the state Government many other dignitaries. Besides these, modern Bihu dance is also performed on this auspicious occasion at the village of Raja-Mayong, Hatimuria and Burhamayong village respectively.

The worship of the five deities therefore is an example of religious toleration and liberalisation. Firstly, embraces all the deities of diverse sects of believers from Shaiva Shakta and Vaisnava as well as the worshippers of demigods and goddesses. Secondly, it has led to a kind of peace and tranquility in the society. It creates the religious tolerances in the minds of people among the varieties of religious faith and practices in Hinduism. It is a unique social institution through which the people of Rajamayong have formulated a little India into a greater Indian society.

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## **Socio-Cultural Aspects of Tibetan Refugees with Special Reference to the Settlement of Mainpat, Chhattisgarh**

\* Sanjiv Kumar Lavania

\*\* L. S. Gajpal

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***Abstract-** This research study is an academic attempt as a part of social sciences' curriculum to understand present socio-cultural nature and practices of Tibetan-refugees by studying this Mainpat settlement in Chhattisgarh. It is an outcome of well organized efforts to draw the information from the refugees restricted to this settlement. This paper talks about type of families found, togetherness and cohesiveness among people, formal and informal set-up in society, practices of rituals, inclusion of modernity in their life style, their perceptions, their beliefs and significance of their religion in their lives and their assimilation with Indian culture. Researchers want to try to explore different dimensions of socio-cultural regime of Tibetan refugees in this settlement. It is not an attempt to highlight their own culture whereas the degree of their incitement to other cultures, especially the culture of host nation and their attachment to the nationality of host nation. There is an assessment of their different kinds of perceptions allied to different spheres of their socio-cultural life.*

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**Key Words-** Socio-cultural nature, togetherness and cohesiveness, inclusion of modernity, assimilation with Indian culture, the degree of their incitement.

**Introduction:** Tibetan people as refugees are living in India for last 60 years, during this period, they have come up with their three generations and availing every moment of their life. Now, they are quite well settled and they have good enough resources for survival and they are receiving almost same treatment in India as other Indian citizens. As refugees, they are found more organized and united and initially when they came to India, they were putting their efforts only for survival but now because of their hard working nature, they are enough competent and availing fair life and they have their acceptability not only in India but also throughout the world as Tibetan refugees with Indian Label. Here, it does not seem to mention the conditions in which

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\* Ph. D. Scholar, Pt. Ravishankar Shukla University, Raipur (C.G.) Assistant Professor and Head, Department of Sociology and Social Work, Pt. Sundarlal Sharma (Open) University, Chhattisgarh, Bilaspur (C.G.),

\*\* Supervisor, Associate Professor and Head, School of Studies in Sociology and Social Work, Pt. Ravishankar Shukla University, Raipur (C.G.)

they came from Tibet to India but evidently it requires. As we know that previously Tibet has a glorious history and as a nation or a state Tibet was regarded as strong country, many times Tibet attacked at other neighbor countries and other neighbor counties attacked at Tibet, Tibet was regarded as having unique identity and entity as a country. But there was a turning point in the history of Tibet when China attacked at Tibet in 1950 and Tibet was encroached and occupied fully and Tibet became the part of China's regime. Tibetans highly believe in cultural ritual practices and they strongly follow Buddhism but the China favors only communist pattern so each and every cultural and religious activity was banned by the china in the Tibet and Tibetan had lost the autonomy in the Tibet, it was quite difficult time to them and their cultural and religious beliefs and activities were major portion of their lives but at that time physically they were alive in Tibet but by emotions and by spirits, they were broken and finished then they decided to leave the Tibet and in the year 1959, 80000 Tibetans under the leadership of present Dalai Lama fled to India for their socio-cultural viability. In India they were placed in different settlements in different states with suitability of low temperature considering their physical survival. They have been operating their own government in exile from Dharamsala, Himachal Pradesh. Mainpat (Chhattisgarh) settlement of Tibetan refugees were allotted in 1962. They were given 2000 approximately acres land on lease for the purpose of residence and agriculture. Approximately, 170 families are residing into the settlement and there are 7 camps in the settlement. Settlement is equipped with all necessary infrastructure and amenities. Every camp has its separate temple or assembly place and nearby camp no.1 there is a big temple of the Lord Buddha with the religious schooling.

As we know, the Tibetans came to India for cultural autonomy and viability, so there is a natural point of attraction to study their socio-cultural aspects.

*According to G. Hofstede, "Culture is the collective programming of the mind which distinguishes members of one category of people from another."*

*According to C. Kluckhonn, "By culture we mean all those historically designs for living explicit and implicit, rational, irrational, and non-rational, which exist at any given time as potential guides for the behavior of men."*

*According to J. A. Banks, "Most social scientists today view culture as consisting primarily of the symbolic, ideational, and intangible aspects of human societies. The essence of a culture is not its artifacts, tools or other tangible cultural elements but how the members of the group interpret, use, and perceive them. It is the values, symbols, interpretations and perspectives that distinguishes one people from another in modernized societies. People within a culture usually interpret the meaning of symbols, artifacts, and behaviors in the same or similar ways."*

Being based on the understanding of culture as mentioned above, by this research paper there is an attempt to find the status of these socio-cultural elements in Tibetans' socio-cultural regime in this settlement.

**Research Method:** This study covers only socio-cultural aspects related to Tibetan those are living in the Mainpat settlement. Therefore, the area of research is Mainpat (Ambikapur) Chhattisgarh. The target people are Tibetan refugees as our respondents. The major portion of this study is based on primary data and somehow for supporting view there is usage of secondary data. To collect the primary data, interview schedule and observation method have been used, there are approximately 170 families are residing over there and 130 families are covered for this purpose and representative of the family is our respondent.

#### Tabulation of Collected Data:

<b>Table No.1 Response for the type of family</b>		
Particulars	Frequency	Percent
Joint Family	5	3.8
Nuclear Family	125	96.2
Total	130	100
<b>Table No.2 Response for the membership of any social-cultural organization</b>		
Particulars	Frequency	Percent
Yes	126	96.9
No	4	3.1
Total	130	100
<b>Table No.3 Response for the participation in the community work</b>		
Particulars	Frequency	Percent
Always	127	97.7
Sometimes	3	2.3
Never	0	0
Total	130	100
<b>Table No. 4 Response for call by community to consult on special incidents</b>		
Particulars	Frequency	Percent
Always	122	93.8
Sometimes	8	6.2
Never	0	0
Total	130	100
<b>Table No. 5 Response for adoption of modern life style</b>		
Particulars	Frequency	Percent
Very Much	6	4.7
Normal	119	91.5
Very less	5	3.8
Total	130	100
<b>Table No. 6 Response for equal importance of boys and girls in family</b>		
Particulars	Frequency	Percent
Always	128	98.5
Sometimes	2	1.5
Never	0	0
Total	130	100
<b>Table no. 7 Response for belief into traditional culture and custom</b>		
Particulars	Frequency	Percent
Always	90	69.2
Sometimes	40	30.8
Never	0	0
Total	130	100

<b>Table No. 8 Response for base of social status</b>		
Particulars	Frequency	Percent
Academic Level	108	83.0
Business Level	1	0.8
Economic Level	17	13.1
Family Traditional Level	4	3.1
Total	130	100

<b>Table No. 9 Response for reasons to send the children in Tibetan school only</b>		
Particulars	Frequency	Percent
To save Culture	86	66.2
An Effort to Return to Tibet	12	9.2
Adjustment Problems in Other school	20	15.4
Others	12	9.2
Total	130	100

<b>Table No. 10 Response for the importance of group leader/camp leader</b>		
Particulars	Frequency	Percent
Very Much	128	98.5
A Little too Much	2	1.5
Not at all	0	0
Total	130	100

<b>Table No. 11 Response for any difficulty in the following own culture at the settlement</b>		
Particulars	Frequency	Percent
Never	122	93.8
Sometimes	8	6.2
Total	130	100

<b>Table No. 12 Response for the importance of religious and cultural practices</b>		
Particulars	Frequency	Percent
Very Much	128	98.5
Sometimes	2	1.5
Never	0	0
Total	130	100

<b>Table No. 13 Response for celebration of Hindu festivals (Dipawali etc.)</b>		
Particulars	Frequency	Percent
Yes	103	79.2
No	27	20.8
Total	130	100

**Table No. 14**

**Response for celebration of Western festivals**

**H 01:Response is independent on Age**

**H 11: Response is dependent on age**

Age	Yes	No	Chi square	Df	P Value
31-50	36	03	36.991	2	0.000
51-70	40	24			
71-90	05	22			
Total=130	81	49			

By above table we find that Chi-square value is 36.991 with 2 degree of freedom and its p value is 0.000. The p value indicates that null hypothesis may be rejected at 0.01 level of significance and data is highly significantly differing.

Hence, we may conclude that this response is dependent on age.



**Table No.15**

**Response for celebration of Indian national festivals. (15<sup>th</sup> august, 2<sup>nd</sup> October, 26<sup>th</sup> January etc.)**

**H 01:Response is independent on Age**

**H 11: Response is dependent on age**

Age	Yes	No	Chi square	df	P Value
31-50	36	03	37.352	2	0.000
51-70	41	23			
71-90	05	22			
Total=130	82	48			

**Interpretation:** **Table No.1**, There was 96.2 percentage of respondents as nuclear family. **Table No.2**, 96.9 percentage of respondents were having membership of social or cultural organization. **Table No.3**, 97.7 percentage of respondents as contributing in the community work. **Table No.4**, 93.8 percentage of respondents were asked for their opinion by community at special occurrence. **This all (Table 1-5)** reflect the high degree of belongingness, togetherness and cohesiveness among the people of settlement in spite of the fact, there was majority of nuclear families. **Table No. 5**, 91.5 percentage of respondents used to adopt modern life style 'normally', **Table No.6**, 98.5 percentage of families said that they equally treat girls and boys 'always'. There were less possibilities of gender inequality. **Table No.7**, 69.22 percentage of respondents said 'always' and 30.8 percentage as 'sometimes' used to believe in traditional customs, **Table No. 8**, 83.0 percentage of respondents were in the favor of academic level as the base of social status, it clearly present how they are curious to attain the academic excellencies. **Table No. 9**, response for reasons to send their children in Tibetan school only, there were 66.2 percentage of respondents said to 'save the culture' and 9.2 percentage of respondents said as 'an effort to return' to the Tibet and 15.4 percentage of respondents said as 'adjustment problem' in other schools and 9.2 percentage of respondents said 'other reasons', they are very much conscious to save their culture. **Table No. 10**, 98.5 percentage responded 'very much' to the importance of group leader / camp leader, every camp has one elected leader and settlement has proper elected body with chairman, so we can say that they have more organized formal system at social, cultural and political level for their people well being. **Table No.11**, 93.8 percent of respondents expressed 'never' difficulty in following their own culture and religion at this settlement; it is the proof of 'safe place 'India' for all cultures and religions of the world. **Table No. 12**, for religious and cultural importance (religious practices and symbols at home, name given to children by Lama, participation in weekly prayer, excursion as pilgrimage, ethnic dresses on cultural and religious occasion, marriage according to their cultural pattern, religious activity at the time of birth, visiting temple), they responded highly

‘very much’ 98.46 percentage nearly 100 percent, it is amazing to say that they have soul connection to their culture and religion, it is the reason to preserve their culture and religion and they fled from China occupied Tibet for shelter in India. **Table No. 13**, 79.2 celebrate Hindu festivals, **Table No. 14**, 62.3 percentage of respondents celebrate western festivals, according to chi-square test, response is dependent on age. **Table No. 15**, 63.1 percentage of respondents celebrate Indian national festivals, according to chi-square test, response is dependent on age.

**Conclusion:** Data clearly show that Tibetan refugees are more formal and practical and have recognition of individual efforts and simultaneously they are more united and have a good formal structure of informal bonding among the members of this settlement. It is very obvious fact that they found themselves very near to Indian culture and very old affinity with Indian culture and most of the Tibetan refugees were found to celebrate Hindu’s festivals as Deepawali. But, there is interesting fact that there is a good number of such Tibetan refugees who are celebrating Indian national festivals and western festivals, by applying statistical tool as Chi-square it was found that this data was very significant age-wise and it was observed that Tibetan refugees of below 50 years of age pay more respect to India and exhibit attachment to India as a nation consciously by celebrating Indian national festivals and as they are celebrating western festivals, it displays their globalised mind set of new generations. It is very interesting fact that their struggle for the freedom of the Tibet is being led by their religious and cultural Guru (His Holiness Dalai Lama) and he is a brand ambassador of their culture and religion in the world and it is a well known fact that he has successfully created a space for Tibetan refugees in the world for their aspirations as they are gaining moral support for the freedom of the Tibet and providing them survival resources in the India and out of the India as well, only one thing behind of this scene as data clearly depict that Tibetan refugees highly believe and celebrate their own culture and religion and put their best efforts in this settlement to retain their culture, at the same time they regard and pay respect to other religions and cultures and also celebrate some globalised events. This Tibetan-refugees settlement in Mainpat, Chhattisgarh is a miniature of Tibetans’ culture along with partial assimilation with Indian and globalised culture and it proves India as safe heaven for all cultures and religions of the world.

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## **Spatio-Temporal Analysis of Ageing in Assam: Census based Perspective**

\* Rima Devi

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***Abstract-** The proportion of population having 60 years and above is increasing day by day which collectively termed as "Ageing". Nearly 961 million of them have been found the entire world that contributes to 12.3% in 2015 and projected to reach at 21.5% in 2050 onwards. It has been continuing in respect of all developed as well as developing countries. It may result in the consequences of declining mortality with higher expectation of life at birth. As a developing country, India has also fascinated this issue with 8.6% while expectancy of life rate standing at 67 years in 2011. It is fortunate to us of having blessing of older in our life but at the same time, it remains an upcoming serious challenge to them to cope themselves as well as they can. There remains depletion of ethical as well as social values regarding the aged. So far this issue is concerned at present time, there is a need of urgency of discussion on it. The present paper has been prepared for showing this immense challenging issue of ageing along with growth, causes and consequences as well as the most convenient tool in this regard i.e., the ageing index and old age dependency ratio as a whole. It is made up for the state of Assam in respect of 1991-2011 onwards. The paper is based on secondary data only.*

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**Key Words-** Ageing, Life expectancy, Mortality, Ageing index, Old-Age Dependency ratio.

**Introduction:** Assam is fascinating an increasing rate of elderly proportion where the net figure is touched to 6.64% in 2011 and it is estimated to be 7.58% in 2021 onwards. Their contributions in respect of rural-urban compositions are 6.51% and 7.52% respectively. Like this diversity, there remains another one in respect of gender which shows 6.70% are female as against 6.61% of male counterparts. People having higher expectation and better quality of life tries to overcome from all stresses as well as wants to enjoy the rest part happily. Having wishes of sustaining longer life helps the elder of becoming younger themselves and thus proportion of them is steadily increasing. The improvement of medical facilities remains a stronger cause which effect is in result of ageing in this case. As the urban areas are more privileged regarding health issues and health care institutes, the proportion of urban elder has been found slightly higher than the rural dwellers. Besides, it is worth mentioning in this context is that the duration of life span of male

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\* Research Scholar, Gauhati University

elderly is slightly lower than the female parts as they have contaminated with various diseases like hypertension, diabetes, kidney problem, piles, mental and nervous problem etc. may be considered as a probable cause for lost of spouses of female at early time. All these facts are very much correlated with the overall development of a nation. The increasing proportion of elderly will lead to higher dependency ratio over the working sectors which will become a serious threat in near future. Therefore, there is a urgent need to give some importance on the issues related to ageing. Keeping in mind, the present paper has been prepared related to the vulnerability facts of elderly particularly in context of Assam based on census data 1971-2011 onwards.

**Objectives:** The main objectives are

- i) to find out the trend of growth and spatial variation of distribution of elderly population in Assam
- ii) to explore the trend of ageing index and old age dependency ratio in Assam

**Methodology:** The present paper has been prepared based on secondary data collected from census board, Govt. Of India, particularly for 1991, 2001 and 2011. The theoretical framework has been developed through the reviews related to the concern topic. All collected data has been finalised and organized in a tabular form and based on this, various graphs have been used to portray the findings.

**Result and Discussion:** There has been noticed a radical change in demographic transition at present time which reveals a declining flow of death rate and higher level of life expectancy at birth that causes Ageing in all over the world. So far the state of Assam is concerned, it has also witnessed a slow and steady increasing rate of aged people whose age are 60 and above years.

**Table 1: Trend and Spatial Pattern of ageing in Assam and India, 1991-2011**

Spatial Unit	% of 60+ Population			
	1991	2001	2011	2021*
Assam	7.55	5.90	6.64	7.58
India	6.75	6.91	8.55	10.27

Source: Calculated based on data of Census of India, 1991-2011

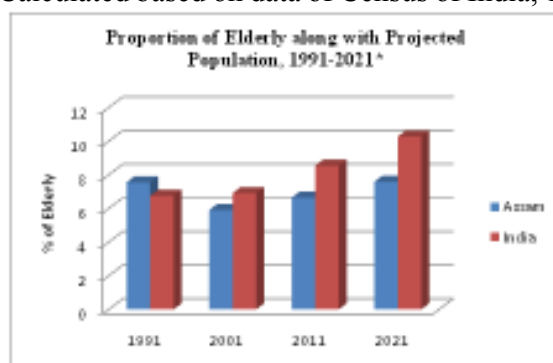


Fig. 1

It is worth mentioning in this regard that the no of elderly may died due to diseases or may be the movement of them to another place influences more or less on the distribution of aged in 2001, revealing a declining picture of having 5.90% as compared to 7.55% in 1991. But gradually it rises to 6.64% in 2011 and projected to reach at 7.58% in 2021 as a whole which delineate a good indicator of transition directly as well as indirectly introduce an upcoming emotionless serious threat of the society. The growth rate during 1991-2011 is 1.04% that is predicted to be increase gradually with distinguishing variation of their distribution into different age groups.

**Table 2: Changing Proportion of elderly into different age groups in Assam, 1991-2011**

Year	Proportion of Elderly into different Age-Groups (%)				
	60-64	65-69	70-74	75-79	80+
1991	2.20	1.10	1.0	2.60	0.70
2001	2.21	1.40	1.10	0.50	0.60
2011	2.48	1.61	1.23	0.59	0.73

Source: Census of India, 1991-2011

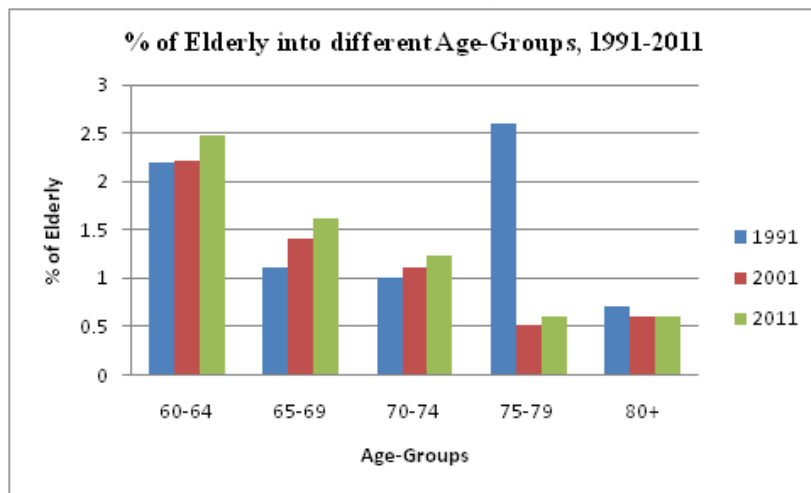


Fig. 2

Though their contribution remains less considerable, yet it has to increase year by year. This age-groups can be define as Youngest-Old (60-69 Years) or Older-Old (70-79 Years) and Old (80+ Years) and in the present context, it has been noticed that the proportion of youngest old people is higher than the two others (Table: 2). It bears great influences on societal contexts gradually. It has further impacted on the ratio in between children and elderly population termed as Ageing Index which is regarded as a conventional tool of ageing. The proportion of children below 15 years has been declining while it is vice versa in respective of elderly proportion and ultimately it indicates the limited scope of ageing i.e., Old-Age Dependency particularly in assessing of economic consequences. Higher the dependency ratio, lower the economic

standards as well.

**Table 3: Trend of Ageing Index and Old-Age Dependency Ratio of Population in Assam, 1991-2011**

Spatial Unit	1991		2001		2011	
	Ageing Index (%)	Old-Age Dependency (%)	Ageing Index (%)	Old-Age Dependency (%)	Ageing Index (%)	Old-Age Dependency (%)
Assam	18.77	13.95	15.65	10.33	20.28	11.02

Source: Census of India, 1991-2011

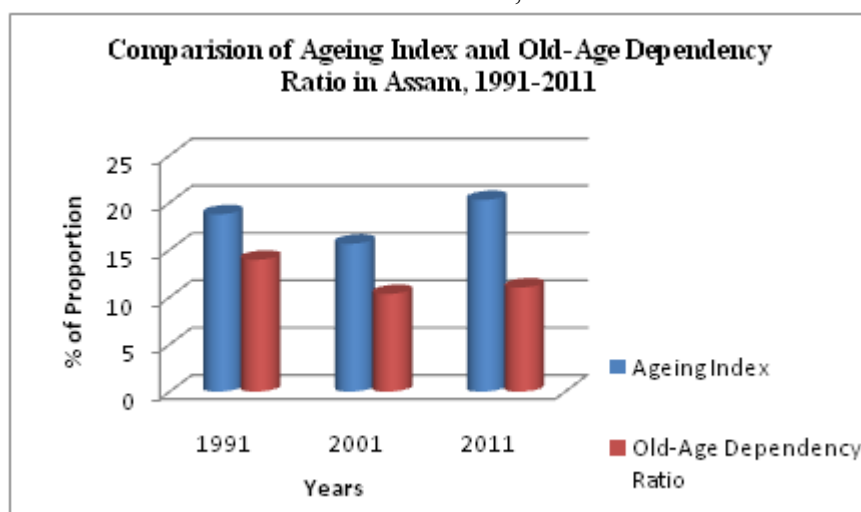


Fig. 3

Ageing index is used to calculate the proportion of aged per 100 children below 15 years of age and while the old-age dependency ratio has been formulated by dividing the no of aged per 100 persons of working age-group (15-59 years). It is worth mentioning (Table: 3) that during 2001, the flow of the proportion of both indices are down ward which may caused due to regional disparities, epidemics etc. The tendency to increase the dependency burden on working age groups reveals throughout the year. It has great impact upon the socio-economic aspects in remaining part of life of the older. The absence of ethics related to older has been gradually diminishing among the people reschedule as a serious challenges of ageing. The combination of all these aspects reveals the upcoming threat of elderly population as being an isolated part from the mainstream of populace. People started to behave the elderly as like a burden for them. The coping capacity of elder with the present generation is in miserable situation that resulting in abuse of elderly in both inside and outside of family. In this context, introducing of old age homes for the welfare of elders should be given priority.

**Conclusion:** Old age is the last part of our biological life cycle. We born grow and at time surely to die. No one can deny of getting old as per the nature's demand. Old age is a most difficult part of life. At time, older wants

to be happy from all sides and it should be our duty to make their life as convenient as we can. Though their proportion has been increasing year by year, but it does not mean that we treat them unwell and force them to think themselves as secluded, separated and rendered powerless as well.

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## **Assessment of the Rural Health Care Infrastructures and Manpower Services and Its Scenario in India**

\* Raju Saikia

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***Abstract-** Health is prerequisite for well being of the people. Good health represents better outcomes in the economy; it is the ability of the people to manage their physical, mental, and social aspects throughout the life. This paper tries to focus on the assessment of Health services and their impact on the people. It is based on the secondary data where it focuses mainly on the infrastructures and the manpower development in the health sector.*

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**Key Words-** Health, Physical, Mental, Social, assessment.

**Introduction:** Health is considered to be the wellbeing of every people in society. According to World health organization “Health is a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity”. It may be defined as the ability of a people to adopt and manage physical, mental and social aspects throughout the life. In 21<sup>st</sup> century the concept of health can be considered as ability opened the door for self-assessments to become the main indicators to judge the performance of efforts aimed at improving the human health conditions (Jadad, 2016). It is very important to live under what context an individual lives both for his health status and the standard of living. It has been recognize by the World health organization, that the main determinants of health include the social and economic environment (Income, education, literacy, caste etc), the physical environment and the person’s individual characteristics and their behavior.

For achieving an acceptable standard of health for the general population of the country different Health Policies and Programme has been established by the country. The main focus of different health Policies and the Programme is to reduce disparities in health across regions and communities by providing access to affordable health, especially to the weaker sections and the underprivileged like women and children, the older persons, disabled and different tribal groups. This paper tries to study the assessment of the performance of the country’s health related indicators (expectancy at birth, child and maternal mortality, morbidity). The paper tries to review the progress of primary health care services in India, especially in rural areas. It will try to look on the origin and evolution of health care services in India, where it tries to cover the details of the different stages of primary health care in India.

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\* Research Scholar, Gauhati University

**Rural health care system in India:**

The rural health care system in India has been developed as a three tier system- sub centers (SC), Primary health centers (PHCs), Community Health Centers (CHCs). The sub centers is considered to be the most peripheral and the first contact point between the primary health centers and the community, the PHCs is the first contact point between village community and the medical officers, and CHCs is the referral centers for four PHCs. For the overall development of the health care systems the growth of these entire health care system is prerequisite ( Saikia, 2014). There are different committee and reports which give prior importance in the development of these health centers starting from the Bhole committee (1946) to Alma Ata Declaration (1978) to current NRHM (2005-till date).

**Data sources:**

The paper is solely based on the secondary data, where data has been collected from various sources such different committee reports, Rural Health Statistics, National Health Profile, census, Bulletin, SRS Data sheet Government of India and the World Bank Online Data Base.

**Evolutions of health care services in India:**

Modern health care in India emerged and was evolved under the colonial rule. These health care services began as a public financial activity for the armed forces in the middle of the 17<sup>th</sup> century, and again as colonial rule expanded, the health services too expanded, getting organized into the Indian Medical Service by 1764. However with the passage of time the government of India act-1919, health become a provincial subject and health services had a distinct racial character. The state finance most of the medical institutions in 1910 it were around 75% and in 1940 it move to 92% and it keeps on increasing. It was a landmark in the evolution of health services in India. Different committees has given different reports and emphasized on the medium and long term perspective for the development of the medical services. These committees mainly focus on the integrated health care, social and preventive aspects of medicine, people's participation and strong cooperation for the realization of development of different health goal in the society.

Major policies or committee for the development of health care services are:

- 1946 Bhole Committee Report on Health Survey and Development
- 1948 Sokhey Committee Report on National Health
- 1952 Community Development Programme
- 1962 Mudaliar Committee Report on Health Survey and Planning
- 1966 Mukheree Committee Reports on Basic Health Services
- 1967 Jungalwalla Committee Report on Integration of Health Services
- 1973 Kartar singh Committee report on Multipurpose Health Workers
- 1975 Shrivastav Committee Report on Medical Education and Support manpower
- 1977 Rural Health Scheme: Community Health Volunteer Scheme-Village

### Health guides

- 1978 Alma Ata Declaration – Health for All by 2000
- 1980 ICSSR and ICMR Report – “Health for all- An alternate Strategy”
- 1983 Mehta Committee on Medical Education Review
- 1983 First National Health Policy
- 1987 Bajaj Committee on Health Manpower Planning, Production and Management
- 1996 Bajaj Committee on Public Health Systems
- 2000 National Population Policy
- 2002 Second National Health Policy
- 2005 National Rural Health Mission (NRHM)
- 2013 National health policy (NHM)

### Health care infrastructure in India:

With the implementations of different health policies and the reports of the committees it can be seen that there is an overall development of the health scenario in India. The health care infrastructure in rural areas has been developed as a three tier system and is based on the following population norms.

**Table-1, Population norm for different health care facilities**

	Plain	Hilly/Tribal's
Sub Centre	5000	3000
Primary Health Centre	300000	20000
Community Health Centre	120000	80000

Due to prior importance on the healthcare facilities it can be seen that the medical education infrastructure in the country has shown a rapid growth. There are 460 medical colleges recognized by the Medical Council of India during 2016-17. In case of service sector there are 12,760 hospitals having 576793 beds in the country. 6795 hospitals are in rural area with 149690 beds and 3748 hospital are in urban area with 399195 beds which is increasing day by day. There is a increase in the total sun centers, primary health centers, community health centers.

The availability of manpower is one of the important prerequisite for the efficient functioning of the Rural Health Infrastructure. As on March 2010, the overall shortfall (which excludes the existing surplus in some of the states) in the posts of HW (F) / ANM was 8.8% of the total requirement as per the norm of one HW(F) / ANM per Sub Centre and PHC. The overall shortfall is mainly due to shortfall in States namely, Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jammu & Kashmir, Kerala, Orissa, Tripura and Uttar Pradesh. Similarly, in case of HW (M), there was a shortfall of 64.1% of the requirement. In case of Health Assistant (Female) / LHV, the shortfall was 31.9% and that of Health Assistant (Male) was 44%. For Allopathic Doctors at PHCs, there was a shortfall of 10.3% of the total requirement. This is again mainly due to significant shortfall in Doctors at

PHCs in the States of Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Orissa, Punjab, Uttarakhand and Uttar Pradesh.

It has been seen that there is increase in the man power facilities in the medical institutions too for instance; the number of ANMs at Sub Centres and PHCs has increased from 133194 in 2005 to 191457 in 2010 which amounts to an increase of about 43.7%. Similarly, the Doctors at PHCs have increased from 20308 in 2005 to 25870 in 2010, which is about 27% increase. Moreover, the specialist doctors at CHCs have increased from 3550 in 2005 to 6781 in 2010, which implies an appreciable 91% increase in 5 years of NRHM. 71,72 By analyzing the state wise picture, it may be observed that the increase in the ANMs is attributed mainly to significant increase in the states of Andhra Pradesh, Assam, Goa, Haryana, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Uttarkhand, Uttar Pradesh and West Bengal. Similarly there is a significant increase in the number of doctors at PHCs in the states namely Andhra Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Punjab and Rajasthan.

**Table-2, Progress in Health centers**

India	March 2005	March 2011
SCs	146026	148124
PHCs	23236	23887
CHCs	3346	4809

Source: Rural Health Statistics. 2011

#### **Availability of Human Resources in Health centers:**

For the proper functioning of the Health centers, the availability of human resources is an important element. Lack of human resources is one of the important reasons for inadequate provisions of health care services as lack of physical infrastructures, especially in rural areas. When we compare the manpower position of major categories in 2011 with that in 2005, it is observed that there is significant improvement in terms of the numbers in all the categories. For instances, the Doctors in PHCs have increased from 20308 in 2005 to 31641 in 2011 (Table 3). Moreover, the specialist doctors at CHCs have increased from 3550 in 2005 to 120128 in 2011 which implies an appreciable 91% increase in 5 years of NRHM. By analyzing the state wise picture, it may be observed that the increase in the ANMs is attributed mainly to significant increase in the states of Andhra Pradesh, Assam, Goa, Haryana, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Orissa, Punjab, Rajastan, Uttarakhand, Uttar Pradesh and West Bengal. Similarly there is a significant increase in the number of doctors at PHCs in the states namely Andhra Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Punjab and Rajasthan.

**Table-3, Average Rural Population covered by Manpower in Rural Health Centers (March 2011)**

Doctors at PHCs	31641
Specialists at CHCs	120128
Health workers Female/ ANM at SCs &PHCs	4008
Health workers Male at SCs	15955

Source: Rural Health Statistics 2011

Despite the rapid growth in the rural health care infrastructures, the rural health care sector are facing may challenge over the years, one of the major problems confronting the rural health centers is the shortage of Manpower (Saikia, 2014). Shortage of Manpower implies that although the physical infrastructures are largely presents in many states the absence of Manpower makes the whole existing facility useless.

**Table-4, Birth rate, Death rates and Infant Mortality Rates in India 2011**

India	Crude Birth Rate	Crude Death Rate	Infant Mortality Rate
Rural	23.3	7.6	48
Urban	17.6	5.7	29
Total	21.8	7.1	44

Source: Bulletin on Rural Health Statistics in India 2011.

#### Conclusions:

The Paper tries to examine the assessment of health services in Rural India and its impact of Health indicators. The assessment of health centers is discussed in terms of the progress in health centers (SCs, PHCs, and CHCs) facilities available in the health centers and the available manpower. The finding of the study suggest that after the implementations of different health policies there has been a significant increase in the rural health care infrastructures in India, especially in case of health centers. Although a well structured rural health care system exists in the country, the health care sector in the rural India suffers from inadequate physical infrastructures as well as trained manpower. More importantly the existing health centers should be strengthen with adequate required staff and must be well equipped with different machineries.

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## Armed Conflict and Gender Based Violence

\* Juli Deogharia

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*Abstract-* Armed conflict has a negative effect on the lives and life perspectives of people who experience and survive armed violence and war. Both women and men suffer from war that includes violation of their rights, traumas, abuses and loss of control over and access to important resources. The impact of these changes is experienced in different ways to different people. As a result, gender inequalities are exacerbated during periods of armed conflict, which continues during post-conflict reconstruction. Heresometimes the superiority of the men folk also have to be suffer due to some gender based constructions A gender analysis of armed conflict and violence makes visible a broader understanding to recogniseand address the forms of gender-specific disadvantage that are overlooked by conventional, gender-blind representations of armed conflict and its aftermath.

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**Key Words-** Armed Conflict, Gender, Violence

**Introduction:** ‘Gender’ refers to the perceptions of appropriate behaviour, appearance and attitude for women and men that arise from socio cultural expectations. The inequality that women experience during and after armed conflict derives from dominant understandings of gender roles. Gender relations are typically characterised by unequal access to, or distribution of, power. Given that gender discrimination is so prevalent, it influences other dynamics of armed conflict. More specifically, gender analysis in armed conflict highlights the differences between women and men in terms of their gendered activities, their needs, their acquisition and control of resources and their access to decisionmaking processes in post-conflict situations (UNDP 2002). In the context of armed conflict, the perception towards women is as wives, mothers and nurturers, whereas men are cast as aggressors and soldiers. Although women and men do often assume these traditional parts, the reality is that women are also active as soldiers and aggressors, while men may also be victims as well as combatants. Gender relations refers to the ways women and men interact. A key focus of this paper is to explore the impact of armed conflict on gender relations in terms of how power dynamics between women and men are affected by the distinct types of disadvantage that armed conflict imposes.

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\* Assam

**Objectives:** The main objectives of this paper are-

1. To address the forms of gender-specific disadvantages of armed conflict.
2. To analyse about the changes of gender roles during and after armed conflict.

**Methodology:**

The paper is based on secondary sources. informations are collected from books, journals, articles, research papers, internet.

**Discussion :**

A gender analysis allows to understand about how women fulfill multiple roles simultaneously affects gender relations in the household and in society. A mother may be a breadwinner and at the same time she may be an activist, this engagement in both stereotypical and nonstereotypical roles has impacts on gender relations in her household and the society. There have also been example of female leaders in power, such as Margaret Thatcher, Indira Gandhi, engaging their countries in conflict. Whether in their traditional and perhaps stereotypical role as wives and mothers, or as aggressors and supporters of conflict, women continue to experience discrimination, due to the unequal power structures with men. Both women and men suffer war abuses, violence and traumas, disruptions and loss of resources, but the impact of these losses is experienced in different ways and women are often disproportionately affected.

Forced displacement and genderbased violence (GBV) are two examples of impacts of armed conflict, the deliberate strategies of war that destabilise families and communities. Physical and sexual violence, particularly towards women and children, occur with a huge extend during and after armed conflict. Women experience rape and forced pregnancy, forced sex work and sexual slavery, as the consequences of such violations. It is important to note that men too are subject to victimisation and violence, including sexualised violence.

Forced displacement is the violation of human, economic, political and social rights and of the failure to comply with international humanitarian laws' (Moser and Clark 2001: 32). It results in distinct types of disadvantage for both women and men. Displacement disproportionately disadvantages women, because it results in reduced access to resources of household responsibility and increased physical and emotional violence. Displacement often leads to shifts in gendered roles for both women and men. Despite experiences of vulnerability and trauma during the process of displacement, some women get benefit from displacement. They may be given priority for training and development programmes in health, education, as well as in income-generating activities. The skills helps women to assume new roles within their households, becoming the main breadwinners when men have been killed or unemployment after removal from their homes and communities. This shift represents a move away from stereotypically 'masculine' and 'feminine' roles. Men however



may react negative to these changes with depression, alcoholism and an escalation of violence against women in public and private (de Alwis and Hyndman 2002). Displacement does not affect all women the same way. In Sudan, ethnic groups such as the Dinka, Nuer, Nuba as well as other groups in the South and the Nuba Mountains, are marginalised due to their minority status. (ibid)

Gender-based violence (GBV) Physical and sexual violence, particularly against women, continues to be a clear feature of armed conflict. Although it is most often women are targets of GBV, both women and men may be subject to rape; HIV infection, sexually transmitted infections (STIs); damage to physical and psychological health; disruption of lives; and loss of self-confidence and self-esteem. women and girls during and after conflict have to faced violations such as forced prostitution and sex work; trafficking for sexual or other types of slavery; forced pregnancy etc. Also, the impact of GBV has distinct consequences for women and girls such as sexual mutilation; sterility; chronic reproductive health problems; and marginalisation from family and community due to stigma associated with sexual abuse (UN 2002).

After incidences of sexual violence, women are often rejected by family or community. Despite pity for the trauma the women have suffered, society considers the victims as damaged goods. Women also needs particular healthcare because of these violations. Such as additional nutritional and health support. But food scarcity and inequalities in food distribution rendering women and girls more susceptible to malnutrition (UN 2002). HIV infection in conflict zones women face an increased risk, and therefore need special psychological, health and social support.

Women in war zones often experience physical and sexual abuse by male spouses who have been in guilt and anger for having failed to assume their perceived responsibility of protecting their women

Men are the indirect targets of violence against women. The rape of women has considered a public act of aggression, where raping and 'dishonouring' women is used to 'violating and demoralising men' (Bennett et al. 1995: 8). Women are perceived the preservers of family honour, and symbolise a nation's racial purity and culture. The 'abuse and torture of female members of a man's family in front of him is a way to convey the message that he has failed in his role as protector' (UN, 2002: 16). It represents an attack on the entire country through dishonouring women.

Women and men experience violence differently during and after armed conflict. Sexual violence is largely associated with women, but men and boys are also have to faced sexual violence during armed conflicts designed to shatter male power. Although there has been documentation of men's experiences as victims on the battlefield, men continue to be described as 'masculine heroes' (Moser and Clark 2001: 3). A woman can be a victim but a man is never a victim, which is a denial of one of the gendered realities of

armed conflict.

ACORD's experience of running workshops on sexual violence confirms the difficulty of quantifying the extent of male rape because victims are hesitant to speak out (Dolan 2002). Dolan argues that 'the level of stigma attached to male rape is even higher than that associated with female rape', and 'undermining men's sense of masculinity becomes a key channel for men to exercise power over other men'. In this sense, rape or violent sexual abuse as demonstrations of 'masculinity' or power that are potentially weapons that can victimise both women and men in conflict zones.

### **Conclusion:**

From the discussion we have seen that due to armed conflict both men and women have to face problems but in a different way due to some gender based constructions of the society. As such gender based discrimination makes women suffer, like at the situation of armed conflict men also have to suffer. In the case of gender-based violence (GBV), for instance, female victims are shunned by family and community while male victims are unable to access counselling or other services due to hesitating to lose his so-called masculinity. The denial of these and other traumas disrupts our understanding of gender relations, blinding us to the ways in which we may promote gender equality and thereby contribute to the establishment of sustainable, peaceful post-conflict societies.

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## **Demographic Changes in Assam: Challenges and Policy Measures**

\* Dinesh Pegu

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***Abstract-** As per the 2011 census report, Assam's population is 3.12 crore, which was 2.66 crore in 2011. The state witnessed an increase of almost 1 crore population in the last decade. The decadal growth rate of population in the state has been shown falls; however the present rate of increase of 17.7 is an unsustainable level for the state, Assam. The uncontrolled growth rate of population has not only created severe strain on the natural resources and environment, but also hinders the development process undertaken by the Government to improve the quality and standard of living of its people. Moreover it creates more unemployment and poverty ratio. The percentage of people below poverty line in the state 31.98 percent was higher than the national average of 21.92 percent in 2011-12. Over 6 percent of the Assam's population was found to be unemployment as per the fifth Annual Employment-Unemployment Survey (2015-16), conducted by the Union Ministry of Labor and Employment. According to NEDFI report, the state's faces the twin challenges of rapid increasing of young population and increasing unemployment people aged between 15 and 35 from over third (35.64 percent) of its total population.*

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### **Key Words- Demographic Policy, Population, Unemployment, Poverty**

The salience of state's growing population is undeniable, but the state also rapidly transforming per many other demographic metrics. It has been well recognized that the population size, structure and composition have a critical, although not deterministic impact on economic development. However, the demographic changes have great significant in the study of demography in relation to economic development. It is also very significant part of planning processes in the economy.

The demographic change may offer significant opportunities for economic transformation in Assam. However the unique nature of this demographic change will simultaneously create its own challenges. Unless these challenges are clearly address, the demographic change in the state may not yield their anticipated benefits. In this context, this paper reviews trends in Assam's population size, composition and drivers of population change and whether this change are unique and unconventional as compared

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\* Assam

to the other states of India. Moreover, in this paper, attempt has also made to analyze the pros and cons of population growth and policy measures to handling these challenges of demographic changes.

**Objectives:** The main objectives of the study are –

- i. To examined the trends in population growth in Assam since last few decades.
- ii. To examine the age structure of population of Assam.
- iii. To analyze the demographic dividend/challenge of population in Assam.
- iv. To suggest policy measures to address the demographic changes.

**Methodology:**

The methodology of the present paper is scientific and analytical. The study is based on secondary data. Secondary data was collected from official publications like Economic Survey, Assam, Census of India reports and websites of Govt. of Assam.

**Analysis and Discussion:**

**Trends in the growth of population:** The trend in the growth of population in Assam is shown in the table below.

**Table 1: Population size and growth rate in Assam**

Year	Population in Lakh	Decadal Growth Rate	Share (To Total Population of India)
1901	32.9	-----	1.38
1911	38.5	16.99	1.52
1921	46.4	20.48	1.84
1931	55.6	19.90	1.99
1941	66.9	20.40	2.10
1951	80.3	19.93	2.22
1961	108.4	34.98	2.46
1971	146.3	34.95	2.66
1981*	185.2	23.36	2.64
1991	224.1	24.24	2.65
2001	266.6	18.85	2.59
2011	312.06	17.07	2.58

\*Interpolated based on the figures for 1971 and 1991.

**Source: Statistical Handbook of Assam, Govt. of Assam.**

From the above table it's found that the population of Assam has increased with high growth rate after the year 1951. In 1951, the decadal growth was 34.98 which are higher than the present growth rate. Then after the decadal growth rate have been slightly decrease of Assam has raised nearly last 110 years, population of Assam has raised nearly 9 fold with an increase of 279.16 lakhs indicating nearly 849 percent increase in the size of population. Moreover, Assam has experienced higher growth rate than the national growth rate during the last country. Among the Indian states, Assam has one of the highest growth rates in population. As a result the share of Assam in India's population is an increasing from 1.38 percent in 1901 to 2.58 percent in 2011. The population growth rate in Assam has primarily been impacted by a natural increase in the population as determined by the birth

rates and the death rates.

### **Demographic Drivers of population Changes:**

Mortality and fertility both are the key drivers of population change. Decline in mortality and fertility comprise the critical components of population change. Declines in mortality rate are mainly the consequence of complementary progress in modern health care in Assam. The estimated death rate in the state has declined from 17.8 per thousand in 1971 to 8.0 in 2011 (Directorate of Economics and Statistics, 2012). On the other hand an expansionary measure on education in the state has increased the literacy rate and as a result there is a continuous decline in fertility in the recent time. The estimated birth rates have been declined from 38.5 per thousand in 1971 to 27.0 per thousand in 2001 and it further declined to 22.8 per thousand in 2011.

### **Age Composition:**

Along with the change in the fertility and mortality rate age composition of demography also being changes. In order to reap the demographic windows of opportunity in the state, it's very significant to look into the age structure of its population.

**Table 2 : Population of 0-14 years in Assam in census year**

	Year				
	1961	1971	1991	2001	2011
In absolute numbers	4883855	6866444	9014879	9970342	10248899
As a Percentage to Total Population	45.07	46.96	40.22	37.22	32.84

Source: Compiled from Census of India, Assam

The above table indicates that there has been remarkable decline in population in the age 0-14 years in the last six decades in Assam. The decline in this group of population can be attributed to the fall in the fertility and mortality rates experienced by the state during this period. This trend is favorable to the lowering of the dependency ratio in the state.

### **Population 15-59 Years:**

Population age groups between 15-59 years are known as working total population. In order to reap the demographic dividend in Assam, it needs to increase in the ratio of working age population to the total population. From the census of India it's found that percentage of working age population to total population in Assam increased from 50.62 percent in 1971 to 60.43 percent in 2011.

It is also called as ageing people. The ageing group has economic implications as it impacts the dependency ratio in the state. The estimated ageing population slightly increased from 4.24 percent in 1961 to 6.66 percent in 2011.

**Sex Ratio:** Sex ratio defined as the number of females per 1000 males from an important aspect of demographic. It helps in understanding the gender

related issues. It directly affects the marital status, supply of labors, fertility and indirectly affects the literacy, birth rate and death rate. The sex ratio of Assam is comparatively better than the national average. The estimated sex ratio in Assam has increased from 919 in 1901 to 923 in 1991 and 958 in 2011.

### **Challenges of Demographic Changes:**

The ongoing demographic change in the state Assam has created considerable opportunities as well as challenges. In general these opportunities and challenges have been discussed with respect to the economic benefits of a young population. However, the demographics of Assam will not only augmenting the scope of economic development but also, stimulating aggregate demand which is essential condition for economic growth. But the state has unable to reap the demographic advantages due to certain limitations, which are mentioned as below:

#### **1. Handicaps exist on employment and educational fronts:**

The demographic change was not only backed by socio-economic changes, but also generates bulk of adults and poorly educated and unskilled labor force. Unless and until the state is able to convert its labour force into a work force, it will never be able to grab the expected demographic bonus. Education and skill development programmes are the important tools to developing labour force for employable. Although illiteracy rates in the state decreasing gradually however the educational and skill levels of the adults are far away from desirable. Hence, an economic perspective point of view the state has facing a serious challenge with the rapid ageing on one hand and on increasing the unemployment and unskilled labour pool on the other.

#### **2. Inequality in distribution of income and wealth:**

The booming of adult population is not only relatively uneducated and unskilled, but also the benefits of economic growth and social development programmes are not equally distributed across the population growth in the state. This will not only backed by undesirable result of social effects, but also create low consumption opportunities towards majority of the population growth. This will create serious impact in capital formation and saving rates in the future of the state.

3. Urbanization is another important indicator of economic growth. The cities are acting as growth Centre for employment and modern amenities, while rural areas are suffering economic distress due to poor planning and inadequate government support. In Assam, the urbanization is not grown as much as expected pace. As a result overwhelming migration towards the cities in the state.

4. Persisting gender disparities the state pose a huge create to economic development. Child marriage and early marriage contribute to unskilled and unhealthy labour force and the result is gather health burden in the state. This will creates negative impact on the state economy of Assam. Thus, addressing

gender parity is also critical for enhancing the states standard of living for improving its overall economic prospects.

### **Policy Measures:**

In order to address the demographic windows of benefits the government of India and Assam has been initiated various socio-economic programmes and population policy with enthusiastically. In India soon after the independents the law makers recognized the needs for a comprehensive population policy to ensure that the newly independent countries did not falter in its growth and development. However, the state Assam has been witnessing serious population problem and the state has unable to reap the demographic dividend from his increasing young population. Hence, some of policy measures are mention to address the demographic changes.

#### **1. Proper Education Policy :**

Investment in education and training can support the use of demographic opportunity brought about by an increase in the proportion of working age population to total population. The Government of Assam has given emphasis on the human resource and special attention on education system, so that it can help in harness employable skills in the adults. Education and skill development is the key for developing a more productive labour force. Presently, quality takes precedence over quantity in a growing work force when it comes to reaping the demographic bonus. So, well structure educational policy is necessary to harness the demographic opportunities.

#### **2. Enhancement of employment policy:**

The demographic change is not backed by socio-economic changes and therefore the huge numbers of current adults are low skilled and unemployable. Hence, a proper employment policy is necessary to reap to demographic changes, so that the bulk of people irrespective of skills and semi-skills can access to the employment opportunity. It will reduce the income inequality in the state.

#### **3. Reduce the gender disparities:**

An assessment of employment trends in Assam for male and female reveals that although the percentage of both male & female workers in rural and urban areas has increased marginally, the rate of growth had decelerated. Moreover, the female work for participation showed negative trends in the state. So, policy should implement to reduce gender disparities in the state. Equal participation of male and female in rural and urban area will enhanced the quality of life and there by reduced the gender disparities.

#### **4. Ensuring inclusive growth :**

Emphasis should give the inclusive growth through development in agriculture, industry and service sector in the state. Once all sections of the population have access to development process, poverty and unemployment his automatically reduced leading to low birth rate in the state.

### **Conclusion:**

Assam along with India is undergoing rapid demographic change. The demographic outlook of the state looks bright; more equal and will have many benefits. However, the demographic progress in the state has been rapid but not backed by socio-economic changes. As a result there is a considerable deposit in achieving the desired advantage of demographic changes. Hence, the government and non-government organization should take proper steps to addressing the demographic issues in the state with a sustainable manner.

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## **Environment and Sustainable Development: Implications on Tourism Industry of North-East**

\* Abhilasha Mazumdar

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***Abstract-** Healthy Environment is always considered as a Human Right. Humans should understand the Right to protect the Environment. Right to development must be fulfilled so as to equitably meet the development and environmental needs of present and future generations. Sustainable Development means an Integration of development and environmental imperatives. For becoming sustainable, development must have both economic and ecological sustainability. Sustainable development is the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. It is a new concept of economic growth. Tourism is an economic as well as an industrial activity in which many individuals, firms, corporations, organizations and associations are involved. North East India has a rich & varied tourism potential which deserve a substantially greater tourists inflow. In ecological terms it means that the level of tourism and tourists activities has to be compatible with the maintenance and enhancement of ecological balance, biological resources and their diversity. In social and cultural terms it needs to ensure that it is compatible with the culture and values of the people, strengthens community identity, and promotes wider participation. This paper seeks to study about the Need to adopt sustainable tourism strategies to utilize the tourism potential of North East India. Considering, the importance of tourism sector as a catalyst for the development of the region. Eco- tourism segment should be encouraged. Environment should be protected and responsible tourism with sustainable development should be encouraged among the local people of the region. The data collected for this study is taken from various published and other secondary sources.*

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**Key Words- Sustainable Development, Environment, Tourism, North East**

### **Conceptual framework:**

**Sustainable development:** Sustainable development means an integration of development and environmental imperatives. For becoming sustainable, development must have both economic and ecological sustainability. Sustainable development denotes the way in which development planning should be designed. The concept of Sustainable Development signifies policy

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\* Research Scholar, University of Science & Technology, Meghalaya & Assistant Professor, NERIM Commerce College

formulation rather than substantive prescription. Its main merit lies in the fact that it modifies the previously absolute development concept. Actually, the idea that, for the benefit of future generations, present generations should be modest in their exploitation of natural resources has found widespread. The concept of Sustainable use of Resources is of an ancient origin. In absence of the principle of sustainability as a way of life, it was not possible for humans to survive into twenty first century. The term Sustainable development was used at the time of *Cocoyo Declaration on Environment and Development* in early 1970s.

According to the Brundtland Report the concept of Sustainable development contains two key concepts:

- The concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given
- The idea of limitation imposed by the state of technology and social organization on the environment's ability to meet present and future generation's needs.

**Tourism:** Tourism is an economic as well as an industrial activity in which many individuals, firms, corporations, organizations and associations are involved. India has a fantastically rich & varied in tourism potential to deserve a substantially greater tourists inflow than so-called other foreign tourists paradise which have least of almost everything to offer but which somehow manage to get more tourists. The tourists-both domestic and foreign-all contribute to develop the economy of the area, to provide employment for the people and afford opportunities to assimilate the best in many and diverse cultures. The sustainable tourism may be perceived in different ways. In ecological terms it means that the level of tourism and tourists activities has to be compatible with the maintenance and enhancement of ecological balance, biological resources and their diversity so that the capacity of the environment to regenerate itself is not impaired. In social and cultural terms sustainable tourism development needs to ensure that it is compatible with the culture and values of the people, that its benefits are broadly shared, and that it strengthens community identity, promotes wider participation in decision-making and enhances peoples control over their own lives. In economic terms sustainable tourism development needs to facilitate a process of development that is economically efficient, has positive backward and forward linkages that relieve pressure on fragile resources, and allows and promotes management of resources in ways that not only support present needs but which can also support the needs and aspirations of future generations.

#### **Overview of Tourism in North East:**

North Eastern part of India comprising the states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura possess great Physical and human diversities to project it as one of the most potential areas of the country in terms of Tourism. Tourism would develop the region

economically and socially. Considering the significance of the Tourism Sector as a catalyst for regional development and the need to adopt sustainable tourism development strategies. North East Region is one of the promising region of the country in respect to tourism. North East is full of rich flora and fauna, wildlife and beautiful landscapes. But, This region has failed to take the advantage of its regional, national and international linkages which have developed. Lack of planning, developing and managing in this region has led to failure to use the benefit of this industry. Now a days, tourists demands for recreational activities rather than visiting monuments. Demand for recreational activities have increased for the tourists. Over the years, tourists are becoming more experienced and balanced in their travel. They are also socially and environmentally sensitive. They demand environmentally cleaned, non-polluted, greenly destinations where they can enjoy nature. Local people have failed to understand the concept of sustainable development and the ways which can lead to sustainability.

**Objective of the study:**

- To study the need to adopt Sustainable Tourism strategies to utilize the potential of North East Region.
- To study the Implications on Tourism Industry of North East.

**Research Methodology:**

The research paper is the form of an explanatory study in analyzing and understanding Environment & Sustainable Development and its implications on the Tourism Industry of North East. The present study is based on Secondary data sources which is collected from various published sources like books, published thesis, reports.

**Results and Discussions:**

As prospects of tourism is changing, tourism industry and its relationship with natural and cultural environment necessitates new paradigms to manage tourism development. Sustainable development advocates for better exploration of resources. Sustainable tourism should be encouraged in North East. Tourism planners need to pay attention on various key issues such as Conservation of natural resources, Encouraging tourist facilities such as communication, infrastructure, transportation, local people safety, community involvement, education and training. Conservation of resources which is a part of bio diversity, North Eastern region of India has got the most attractive and potential to be developed as a tourist hub. It is also important for extension of Tourism sector. Conservation of natural resources will encourage various segments of Tourism such as river tourism, mountain tourism, eco tourism, recreational tourism. It is also required that conservation linked agencies are required to work little meticulously. Eco tourism segment should be encouraged. States like Assam, Meghalaya, Arunachal Pradesh provides great forest resources, which can be encouraged as destinations for Eco tourism. Preservation of Historical monuments in North East is also a way to focus on

cultural tourism in near future. Cultural tourism includes arts, handicrafts, music, dance and dramas. Community involvement should be encouraged. Community involvement is necessary to attain Sustainability. Community involvement is required in towns, villages and rural areas in order to bring benefits and economy to the local people. Recreational activities should be also encouraged such as fishing, planting. For this, land should be made available for tourism activities. Government should focus on this issue of proper allocation of land for tourism activities. Better management and proper planning at the local and state level will encourages sustainability, so that tourism segments can sustain. Tourism education and manpower strategies will help in emerging of this sector. Local awareness regarding safe and healthy environment among people is very important. Healthy environment is a not a need but is has become a Human Right. As a result, Sustainable Tourism strategy is needed to encourage the potentials of tourism sector in North East India. Sustainable tourism will bring a planned and balanced environment for the future generation. And in terms of Tourism, More and more Economy for the region with green and vibrant tourism activities. Certain Implications on the Tourism Industry of North East are: Positive effects are like Conservation of Natural resources and Cultural heritage, Development of Local Communities, Creation of employment and income for local communities. Negative Effects are Pollution, Energy and Water Consumption, Loss of biodiversity.

#### **Conclusion:**

Tourism has become one of the most important Service Industry. It is based on globalization and its role in the global development, whereas its dimension is local. Sustainability is usually addressed for the conservation of natural resources and environment, in order to preserve it for future generations. North East is full of natural resources and Cultural heritage. And, sustainability involves both natural and cultural resources. With the implementation of proper polices and guidelines, Sustainability can be achieved. Eco-Tourism Segment should be encouraged.

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## **Elevation of Employees through Training and Development: An Overview**

\* Shiwani

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***Abstract-** There is no doubt that organizations worldwide are striving for success and out-competing those in the same industry. In order to do so, organizations have to obtain and utilize her human resources effectively. Organizations need to be aware of face more realistically towards keeping their human resources up-to-date. In so doing, managers need to pay special attention to all the core functions of human resource management as this plays an important role in different organizational, social and economically related areas among others that are influential to the attainment of the organizational goals and thus organizations successful continuation in the market. This study, therefore, goes on to discuss one of the core functions of human resource which is training, employee performance, and how the earlier affects the latter. This research article will prevail the benefits of training which will help in employees elevation.*

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**Key Words-** Training, Development, Skill Management, Performance Appraisal ,HRM

**Objective of the Study:** In light of the above background, the aim of the study is to examine the effects of training on employee performance and elevation.

- What training programs exist in the organization?
- What are the training objectives?
- What methods are used and do these methods meet the training objectives?
- How does training affect employee performance?

It is expected that the findings of this study will help highlight the ways in which human resource training can be beneficial not only to the organizations but also to the career development of its employees. All in all, the results pave way of improving human resources needed for the competitive performance of organizations.

**Introduction:** Training and development is one of the major functions within HRM, training has for long been recognized and thus attracted great research attention by academic writers (see e.g. Gordon 1992, Beardwell, Holden & Claydon 2004). This has yielded into a variety of definitions of training. For example, Gordon (1992, 235) defines training as the planned and systematic

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\* Research Scholar, Faculty of Management, Magadh University, Bodh Gaya

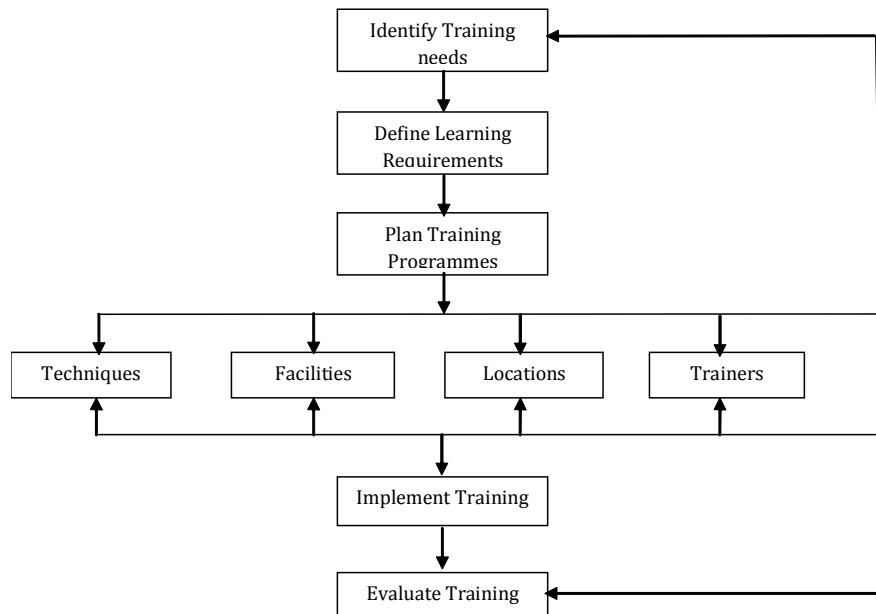
modification of behavior through learning events, activities and programs which result in the participants achieving the levels of knowledge, skills, competencies and abilities to carry out their work effectively.

It is worth nothing that, as researchers continue with their quest into the training research area, they also continue their arguments into its importance. Some of these researchers argue that the recognition of the importance of training in recent years has been heavily influenced by the intensification of competition and the relative success of organizations where investment in employee development is considerably emphasized (Beardwell et al. 2004). Related to the above, Beardwell et al. (2004) add that technological developments and organizational change have gradually led some employers to the realization that success relies on the skills and abilities of their employees, thus a need for considerable and continuous investment in training and development.

**Rationale of training and development:**

The main purpose of training is to acquire and improve knowledge, skills and attitudes towards work related tasks. It is one of the most important potential motivators which can lead to both short-term and long-term benefits for individuals and organizations. There are so many benefits associated with training. Cole (2001) summarizes these benefits as below:

- 1) High morale – employees who receive training have increased confidence and motivations;
- 2) Lower cost of production – training eliminates risks because trained personnel are able to make better and economic use of material and equipment thereby reducing and avoiding waste;
- 3) Lower turnover – training brings a sense of security at the workplace which in turn reduces labor turnover and absenteeism is avoided;
- 4) Change management – training helps to manage change by increasing the understanding and involvement of employees in the change process and also provides the skills and abilities needed to adjust to new situations;
- 5) Provide recognition, enhanced responsibility and the possibility of increased pay and promotion;
- 6) Help to improve the availability and quality of staff.



**Figure 1.** The Process of Planned Training (Source: Armstrong Michael (1995).

### Conclusion :

The importance of training and development in the corporate world has been highlighted. Thus, it is essential to examine any issues related to training and development in any business sector. The purpose of this study is to examine the effects of training on employee performance within the organization. Moreover, sub goals are developed to facilitate a clear achievement of the purpose of the study. These include (1) what training programs exist in the organization, (2) what are the training objectives, (3) what methods are used and do these methods meet the training objectives, and finally (4) examine the effects of training on employee performance.

Human Resource Management involves the management of the human resources needed by an organization and also being certain that human resource is acquired and maintained for purposes of promoting the organization's vision, strategy and objectives. In other words, HRM focuses on securing, maintaining, and utilizing an effective work force, which organizations require for both their short and long term survival in the market. In order for HRM to achieve its organizational objectives, managers should perform a number of basic functions which represent what is often referred to as the management process. It is worth noting that in the existing management literature, HRM functions have been differently classified by different researchers despite the fact that they all serve the same purpose of making available effective human resources through proper training and development programmes.

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## **The perspective of International Compensation: A Theoretical Study**

\* Anamika Tirkey

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***Abstract-** Compensation is a tool used by management for a variety of purposes to further the existence of the company. Compensation may be adjusted according the business needs, goals, and available resources, this article will prevails the various components of compensation that may include: recruit and retain qualified employees, increase or maintain morale/satisfaction, reward and encourage peak performance, achieve internal and external equity, reduce turnover and encourage company loyalty, modify (through negotiations) practices of unions.*

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**Key Words-** Training, Development, HRM , Incentives and Perks.

**Introduction:** Components of international compensation comprises the base salary, incentives, benefits, allowances, foreign service inducement/ hardship premium, long term benefits and taxes etc.

**Base Salary:**

Base salary is the amount of money that an expatriate normally receives in the home country. In the united states, this was around \$ 175,000 for upper-middle managers in the early 1999-2000, and this rate was similar to that paid to managers in both Japan and Germany. The exchange rates, of course, also affect the real wage.

- Expatriate salaries typically are set according to the base pay of the home countries. Therefore, a German Manager working for a US MNC and assigned to Spain would have a base salary that reflects the salary structure in Germany.
- The salaries usually are paid in Home currency, local currency, or a combination of the two. The base pay also serves as the benchmarks against which bonuses and benefits are calculated.

**Benefits:**

- Alternatively known as indirect compensation,
- Benefits constitute a substantial portion of international compensation (approx. one third of compensation for regular employees is benefits).
- Benefits include a suit of programmes such as:
  - Entertainment, Festival celebrations, Gifts, Use of club facilities,

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\* Research Scholar, Faculty of Management, Magadh University, Bodh Gaya

provision of hospitality including food and beverage, employee welfare, use of health club, Conveyance tour and travel, Hotel Board and Lodging, vehicles, telephone and other telecommunication facilities, Sponsorship of children.

- Basically an employee tends to join and stay with an org. which guarantees an attractive benefits programme.
- Vacation along with holidays and rest breaks help employees mitigate fatigue and enhance productivity during the hours employees actually work.

#### **Allowance:**

It is an inevitable feature of International compensation. The most common allowance relates to the cost of living – an adjustment for different in the cost of living between the home country and foreign country assignment. This allowance is designed to provide the expatriate with the same standard of living that he or she enjoyed in the home country.

**Spouse assistance, housing allowance, home leave allowance, relocation allowance and educational allowance are the popular in expats.**

#### **Compensation.**

These allowances are often contingent upon tax – equalization policies and practices in both the home and the host countries.

#### **Incentives:**

- An additional payment (or other remuneration) to employees as a means of increasing output. Increasingly, MNCs these days are designing special incentive programmes for keeping expatriates motivated. In the process, a growing number of firms have dropped the ongoing premium for overseas assignments and replaced it with a one – time, lump-sum premium.
- The lump – sum payment has at least three advantages:
- First, expatriates realize that they are paid this only once and that too when they accept an overseas assignment. So the payment tends to retain its motivational value.
- Second: costs to the company are less because there is only one payment and no future financial commitment. This is so because incentive is a separate payment, distinguishable from a regular pay, and it is more rapidly for saving or spending.
- Third, less chances for pre mature repatriation.

#### **Foreign Service / Hardship Premium:**

This is often perceived as an inducement in the form of a salary premium to accept an overseas assignment. Generally, salary premiums vary from 5—40% of the base salary. Actual salaries depend upon the assignment, actual hardship, tax consequences and length of assignment. In addition, if the work – week in the host country is longer than in the home country, the assignee will be paid for the extra hours worked.

Certain countries are highly hostile to foreigners staying and working. Indians engaged in road construction work in Afghanistan, for example, face constant threat lives. In fact, ten such emigrants got killed in recent times (2006-2007). Expatriates in such environments are paid 2-3 times more than their domestic salaries.

**Long term Benefits:** The most common long term benefits offered to employees of MNCs are **Employee Stock Option Schemes (ESOS)**. Traditionally E-SOS were used as means to reward top management or key people of the MNCs. Some of the commonly used stock option schemes are:

- **Employee Stock Option Plan (ESOP)**- a certain nos. of shares are reserved for purchase and issuance to key employees. Such shares serve as incentive for employees to build long term value for the company.
- **Restricted Stock Unit (RSU)** – This is a plan established by a company, wherein units of stocks are provided with restrictions on when they can be exercised. It is usually issued as partial compensation for employees. The restrictions generally lifts in 3-5 years when the stock vests
- **Employee Stock Purchase Plan (ESPP)** – This is a plan wherein the company sells shares to its employees usually, at a discount. Importantly, the company deducts the purchase price of these shares every month from the employee's salary

**Objectives of study:**

- *What Attract employees* who are qualified, experienced and interested in international assignments?.
- *What Facilitate the movement of expatriate's* from one subsidiary to another?
- *Provide a consistent and reasonable relationship* between the pay levels of employees at headquarters, domestic affiliates and foreign subsidiaries.
- *What are the unnecessary Allowances and Incentives.?*

**Rationale of the study :**

**Factors influencing these components :**

Remuneration or compensation varies country to country and one MNC to another. Mainly based on two factors: External and Internal. <b>Remuneration/ Compensation</b>	External Factors		Internal Factors
	Domestic	- Labour Market - Cost of living - Labour Union - Govt. Legislation - Society - Economy	- Business strategy - Job Evaluation and Performance Appraisal - The employee
	International	- Parent Nationality - Labour market characteristics - Local Culture - Home and Host Countries - Government's Roles - Industry Types - Competitors Strategy	- Goal orientation - Capacity to pay - Competitive Strategy - Org. Culture - Int. Workforce composition - Lab. Relations - Subsidiary role

However, these factors can be classified in five categories:

1. **Prosperity & Spending Power Of the company** (a related factor is the different Tax and social security System in the country.
2. **Cultural Difference**
3. **Policy & Strategies** (in productivity and Performance evaluation)
4. **Situations on the relevant Labour market & Labour capital ratios**
5. **Institutional Frameworks within which wage Bargaining takes place**

**Literature review:** There are (generally) 4 theories in the context of international compensation:

1. Contingency theory.
2. Resource – based theory.
3. The Agency theory and
4. Equity theory

1. **Contingency theory (most popular) :** Expats compensation should be based on particular contingencies or situation prevailing in a host country. The compensation Phil. In every organization is normally de centralized and allows units to localize the compensation structure

2. **Resources based theory:** Human resource is the greatest asset of the MNCs in its competitive advantage needs good pay and st. salary band for cont. motivation. The organizations follow this theory, remain **market – sensitive and are constantly reviewing compensation to retain their position** in the hiring and retaining the talents

3. **The Agency Theory:** This theory focused on the divergent interests and goals of org.'s **stakeholders** and the way that employees compensation can be used to align these interests & goals. According to this theory, there exists a **principle – agency relationship** between the MNCs HQ and its Subsidiaries for Expats Compensation.

4. **Equity Theory:** Equity theory suggests that there should be a fair balance between an expatriate's contribution to an MNC and what he / she receives as compensation. Of late, the equity principle is sought to be compromised with a new approach to compensation – “**Person based rather job centric**”.

**Conclusion:**

One of the key components of IHRM is the compensation administration in MNCs for expatriate. Today, compensation and employee benefits contribute to 40-50% of the total costs. Compensation is strategically reported and monitored at the broad – levels and with the investors to assess the health of the organization. The various compensation management for expatriate. Effective and efficient process of managing the earnings – financial and non financial rewards for the international employees.

International Compensation is an internal rate of return (monetary or non monetary rewards / package) including base salary, benefits, perquisites and long term & short term incentives that valued by employee's in accordance

with their relative contributions to performance towards achieving the desired goal of an organization. It influences:

- Organizational culture
- Recruitment and selection of competent employees
- Motivation and performance

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## **The Employment Quality of the Informal Migrant Workers in Guwahati**

\* Saurabh Pran Sharma

\*\* Anamika Sarma

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*Abstract- Rural- urban migration is one of the major causes of urbanization and is considered as the chief mechanism by which the world's urbanization trends have evolved. Many factors influence migration from the rural areas to the cities. Unskilled workers move in search of manual labour positions that are not available in rural areas. Similarly, educated workers may migrate because their human capital is better rewarded in cities. Inadequate investment and high population growth in rural areas can increase pressure on land and other resources, creating a labour surplus that drives migration. The excess population migrating from rural to urban areas cannot be absorbed by the urban formal sector alone. In addition to this a large portion of rural migrants are basically unskilled and have limited education and hence they are unable to get job in the urban formal sectors. So they are compelled to absorb themselves in urban informal sectors because entry to this sector is free and easy. Assam experiences a process of rapid urbanization. Within the state, the urbanization process was the strongest in Kamrup district. The extraordinary rate of urbanization of Kamrup was fuelled by the explosive growth of its principal city, Guwahati. In this proposed study the researcher wants to study whether Guwahati generates adequate livelihood opportunities to support the multitudes of migrants that come into the city! After reviewing the available literature found so far, it is found that the study related to absorption of rural migrants in urban informal sector in Assam and their quality of works are found scanty. To fill this research gap this proposed research is undertaken.*

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**Key Words- Rural-urban migration, Informal Sector, Quality of Employment**

**1. Introduction:** Economic growth and development involves a movement of population from agricultural areas to industrial areas leading to rapid urbanization. Rural- urban migration is one of the major causes of urbanization and is considered as the chief mechanism by which the world's urbanization trends have evolved.

Many factors influence migration from the rural areas to the cities such as globalization, rural poverty and unemployment or underemployment in

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\* Assistant Professor (Selection Grade), Department of Economics, Arya Vidyapeeth College, Guwahati Assam

\*\* P.G. Student, Department of Economics, Cotton College, Guwahati Assam

rural areas. Unskilled workers move in search of manual labour positions that are not available in rural areas. Similarly, educated workers may migrate because their human capital is better rewarded in cities. Inadequate investment in rural areas adversely affects livelihoods and provides an impulse to outmigration from rural areas. Again, high population growth in rural areas can increase pressure on land and other resources, creating a labour surplus that drives migration.

Assam experiences a process of rapid urbanization. Within the state, the urbanization process was the strongest in Kamrup district. The extraordinary rate of urbanization of Kamrup was fuelled by the explosive growth of its principal city, Guwahati, which accounted for 89.18% of the district's urban population, which indicates that the majority of the rural migrants into the district of Kamrup made for Guwahati.

The excess population migrating from rural Assam to Guwahati cannot be absorbed by the its formal sector alone. Because the organised sectors cannot alone generate employment for the all the workforce migrated from the rural areas. In addition to this a large portion of rural migrants are basically unskilled and have limited education and hence they are unable to get job in the urban formal sectors. So they are compelled to absorb themselves in urban informal sectors because entry to this sector is free and easy.

**2. Objectives:** The main objectives of this study are

1. To discuss the absorption pattern of the rural migrants in various informal sectors in Guwahati.
2. To assess their quality of employment in the informal sectors.

**3. Data Source and Research Methodology:**

**a) Coverage:** The population in the study discusses about the out-migrants from different parts of rural Assam over last two decades and their absorption in various informal sectors in Guwahati.

**b) Data Collection:** The secondary data are collected from the published Govt. reports, Govt. Departments, journals and any other relevant source. To substantiate and complement secondary data, the primary data have been collected. The universe of the study area comprises of 31 wards of Guwahati and these 31 wards are classified in 6 zones as per the guideline of GMC.

**c) Sampling Design:** Out of each zone one to two wards are conveniently selected. Here accidental sampling technique has been appropriated.

Total number of sample is 373. A structured schedule has been used to collect the data.

**d) Data Analysis:** The research methodology consists of quantitative as well as qualitative approaches. For the analysis of data standard statistical and econometric tools have been used.

**4. Findings and Analysis:**

In Guwahati, the number of migrants has significantly gone up by 36.78 % from 1991 to 2001 i.e. from 276,835 in 1991 to 378,657 in 2001. It should

be mentioned that the migration data of 2011 census for Guwahati has not been released till date and so the researcher has to rely on 2001 census in order to find out the magnitude of migration in Guwahati.

In 1991, among the three types of internal migration, inter district migration dominates with a 51.7% of the total migration flows. Guwahati witnessed a very high rate of growth in the period from 1971 to 1991; 8.1 percent p.a., which is likely on account of the city becoming Assam's capital in 1972, migration from rural Assam and other states of the North-East region of India, and also the cross-border migration from Bangladesh after the latter's formation in 1972. Since then, GMC area has registered slowing down of population growth rate, from 3.3 percent p.a. in 1991-2001 periods and 1.8 percent p.a. in 2001-11 periods. This means that the migration rate to the city has slowed down in the decade of 2001-11 due to either decline in migrants from other North-East states and rural Assam or decline from cross-border migration or both.

#### 4.1 Absorption Pattern of Migrants in Informal Sector:

The urban informal sector readily provides sustenance to the rural migrants equipped with low education and skills. This is clear by a recent study which indicates that the informal sector of this city has absorbed about 90 percent of its total workforce (Chakravarty & Barua, 2000).

The workforce in the informal service sector in Guwahati, comprising of the urban poor and lower-income groups, are likely to be petty shopkeepers and vegetable sellers, small shop assistants, mechanics, cleaners, domestic help, cooks and waiters in food joints, construction workers, cycle rickshaw drivers, and manual labourers working in the wholesale and retail markets. In a study conducted by Centre for Urban Equity in eight informal settlements in Guwahati in the year 2012 it was found that predominant employment among the female workers was personnel services (as domestic workers) (25 percent), followed by construction (15 percent), waste collection (14 percent) and public services and administration (12 percent). For working males, the predominant employment was petty trade (24 percent), followed by construction (21 percent), then transport (18 percent) and waste collection (11.2 percent).

**Table 2: Employment Indicators by Gender**

Employment sector (%)	Male	Female	Total
Manufacturing	2.8	4.2	3.1
Construction	20.5	14.6	19.5
Wholesale trade	1.4	0.0	1.2
Petty trade	23.9	10.4	21.7
Waste collection	11.2	13.5	11.5
Transport	18.3	3.1	15.8
Hotel & restaurant	1.4	7.3	2.4



ICT + Finance + Real estate	2.6	5.2	3.1
Public admin + social service	5.7	11.5	6.6
Personnel services	6.3	25.0	9.3
Others (unspecified)	5.7	5.2	5.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Desai et al (2012)

Given the fact that livelihood constitutes a major inducement for migration and the informal sector (which is dominated by migrant labour) generates most of the employment opportunities in Guwahati's economy, it is deduced that there is an intimate relationship between migration into Guwahati and the employment opportunities generated in its informal sector. Hence as migrants stream into the city, most of them (especially the illiterate and unskilled) are initially absorbed into the informal sector. There they eke out a living working as street vendor, hawker, shoe-shine, domestic help, daily wage labourer in construction sites, public works, small garage, tea shops etc. Over a period of time they acquire skill by *learning by doing* and consolidate themselves. Once they establish themselves they induce their families and friends to migrate as well and the cycle continues.

#### 4.2 Employment Quality in the informal Sector:

The quality of employment is a very important point to be addressed in case of the informal workers in a city. The quality of employment is a multidimensional concept. Many international organizations emphasise the importance of quality of employment in their work. In this study the quality of employment of the rural migrants workers in the aforesaid six sub-sectors of urban informal sector are trying to be analysed. In doing following indicators have been used to assess the quality of their works-

1. Working hour -whether working hour is less than 8 hours or more per day!
2. Whether safety measures are used in the work place?
  - Sanitation and safe drinking water in the work place.
  - Any kind of harassment from the employer as well as from the authority in the work place.
  - Social security measures
3. Income per month
4. Child labour
5. Gender-discrimination
6. Education

After analysing the data obtained from the field study it is found that quality of employment is very meagre in case of most of the informal workers in Guwahati. Again the average income level of the rural informal workers is Rs 4714 per month which is higher than the State Monthly per capita income of Rs 2055 but lower than the Monthly per capita income of the district Kamrup Metro which is Rs 5287 as per the report of Human Development of Assam,

2014. Thus the average income earned by the rural informal workers is not at all sufficient to prosecute their day to day minimum expenditures in a city like Guwahati. Besides, most of the works in the informal sectors are of seasonal and temporary nature and as such the actual monthly per capita income of the informal workers may be lower than the estimated amount of Rs 4714. The cost of living in Guwahati has been increasing at a rapid rate for last two to three decades, so the informal workers in Guwahati have been facing difficulties in prosecuting their day to day expenditures.

In the study discrimination of income distribution is observed in respect of Gender. It is seen that the mean income of the male workers (Rs 5200) is more than their female counterpart (Rs3015). It has been observed that 63 percent of the total income is concentrated in the hands of the male informal workers which clearly depicts that female workers are paid less than the male workers for the same work.

Table 7: Gender- Income Gap

Gender	Numbers	Mean Income
Male	290	5200
Female	83	3015

Source- Field Study

Female informal workers are more prone to be abused by the authority compare to the male workers.

It was also observed from the study that out of total surveyed informal workers only 10 percent are working less than 8 hours per day, 20 percent have free medical facility and only 7 percent of the workers are having sanitation and filtered drinking water facility in Guwahati. Though in order to provide social security to the workers in the unorganised sector, the Government has enacted the Unorganised Workers' Social Security Act, 2008 yet the social and economic security of the informal workers are not at all satisfactory in the city Guwahati. The benefits of various social security programs are not being percolated to the informal workers in Guwahati. This is clear from the survey conducted during the course of this research. It was found that only 22 percent of the informal workers are aware of the Programs like APY, PMJBY, PMSBY and only 17 percent of the respondents are enrolled themselves to such Programs only.

From the various study it was found that the most of the rural migrants are of having low skill and lower education and so they are compelled to absorb themselves in the informal sectors. From the field study it is found that 40 percent of the informal workers have no education and 36 percent of the informal workers are having education only to primary level. Thus about 76 percent of the informal workers are of low skill category. Whatever skilled they have gathered are through their self learning in the various activities they have engaged themselves in.

In the study it has been observed that the maximum informal workers' age

group is 30-45 (30.8%) followed by the age group of 15-30 with an employment percentage of 25.2%. It should be mentioned that 6.7 percentages of informal workers are in the age group below 15 years which violates the basic clause of the Child Labour (Prohibition and Regulation) Amendment Act, 2016.

#### **6. Conclusion:**

Thus it is observed from our study that the informal sector is a pivotal sector in providing employment avenues to the people who have migrated to Guwahati in search of better work from the different parts of the Assam. However, conditions of the workers are very insubstantial in respect of the qualities as discussed above. The informal workers are also not able to reap the benefits of the various government schemes due to the lack of awareness among them. So the government as well as the various social organisations should take the initiative to make the informal workers aware about those schemes which are meant for them. Since Guwahati becomes the hub for all the migrants from every respect and as such to reduce the force of migrant workers in the city the social, educational and economic infrastructures of the other sub divisions like Central, Upper, North and Hills and Barak Valley should also be developed.

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## Changing Trends of the Banking Industry

\* Roma Khanna,  
\*\* Monika Khanna, \*\*\* Nidhi Varshney

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***Abstract-** Banking is such sector which performs various financial functions like safeguarding the money, investing money and work as a form of financial institution. Banking industry and its working has been changed from traditional way to modern one. Now banking has provided more security and other benefits to customers. The paper focus on impact of technological advancement, increased competitiveness on the changing scenario, working and products and services of banking industry. This article is an attempt to aid to the knowledge of banking sector and is also helpful to new researchers and bankers.*

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**Key Words- E-banking, Banking Products and services etc.**

The banking industry is one way of investing, borrowing, and storing money. It plays a large part in financial dealings. The banking industry has existed in the life of human beings since time immemorial.

A banking industry is a financial institution in which banks provide services to its users also called customers like cash management, transaction of accounts, throughout the day. The banks also offer investment and insurance products. Apart from it banks also provide other facilities and opportunities to their customers so that customers can be satisfied. For the growth of economy banks contribution is indispensable. They are responsible for providing security to the customer's savings, developing confidence in the customers towards the banks. They also serve as a source of employment. Recently there has been an increase in role of digitalisation in banking sector. Internet has played a very important role in doing so. Now the banks are focussing on new technology based services to its customers like mobile banking, mobile banking apps and e-wallet which makes them different from traditional way of working. Due to digitalisation the working has become smooth.

### **Objectives of the Study**

- To study the changing trends in banking industry.
- To compare the services offered to customers by traditional as well as modern banking system.

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\* Teerthanker Mahaveer University, TMIMT Moradabad

\*\* Rampur Raza PG Degree College, Rampur

\*\*\* IFTM University, Moradabad

**Research Methodology:** The current research paper is based on secondary data. Secondary data has been collected from recently available published secondary data published in annual reports of several banks, survey reports of leading magazines and from several books related to banking sector. For accomplishing the research objectives data was also collected and reviewed the literature on the topic concerned. The Secondary data is also collected from various websites.

**Literature Review:** Garg (1994) worked on Indian commercial banks and stated that they have expanded branches in rural areas and have achieved progress.

Kamesam (2001) laid emphasis on the changes occurring in Indian banking Industry and also said that these changes lead to more advancement and profitability in banks.

The reforms play an important role in working of banking sector in different areas like changing interest rates, survival in the increasing competitive market (Jegade et al. 2004).

Alu et al. (2002) worked on banking sector and the role of information technology in rapidly changing the banking industry. Their work lay emphasis on the impact of IT on bank productivity, work by employees, transactions within banks etc. which affect the growth of banking industry. Biresh et al. (2011) compared the performance of banks in India and said that the positive trend of the reform process is visible through the increase in technical efficiency over the years of the post transition period.

#### **Services Offered By Traditional Banking System:**

Banks provide several services to the customers by knowledgeable employees from tellers to loan providers. At a traditional bank, the customer can conduct a number of banking transactions as depositing savings, exchange of currency transaction, taking personal and business loans, safekeeping of valuables, buying govt. Bonds etc but individuals have to stand in line and wait for their numbers which was inconvenient for users.

#### **Modern Banking Services:**

Now banks are using more use of technology in providing services to the customers or we can say in its working which has led to them a shift from traditional way of working. The most common and modern method is use of internet which is reflected through the below mentioned services

- **Internet Banking** -Banks have created their own websites which is easily accessed by customers. The online banking is done for easy and fast financial transaction. Now customers can anytime and anywhere deal with financial transaction. Various other facilities which are possible through internet banking and were not there in traditional banking are payments of bills, transfer of funds to third parties, portfolio management, transactions for loans etc.
- **Mobile Banking**- Apps of different banks are available which has made customers to do transactions from mobile easily. Customers can anywhere

and anytime use mobile banking and do various activities like balance check, see account details, do various e- payments , investments etc. It has connected customers throughout life. There are various benefits of mobile banking as maintaining good relationship with the customers, gaining profits, promotion of banks etc.

- **Telephone banking-** It is a service which is provided by banks . In this customers uses telephone to conduct banking transaction . This is also known as Phone Banks. Bank and account related information are provided to the customers on phone by this technology.
- **ATM (Automated Teller Machine)-** They are the machines which can be operated by the customers themselves. Customers can deposit and withdraw cash from it. After applying in bank customers get ATM card from bank which is easily read by machine. The customers can withdraw cash, deposit cash, check balance, transfer funds etc. By putting password before entering ATM card in machine.
- **Plastic money-** Now a day it has become necessary in our life and is the best alternative of the cash. In today's scenario carrying a lot of cash is a risk so it is one of the best way . The best benefit of it is easy to carry anywhere and by anyone in pockets.

#### **Modern banking Vs. Traditional banking:**

Banks are such financial Institution which is considered as a basic requirement. People consider banks as security and safety place. Main difference in traditional and modern banking is of physical appearance. People initially choose branch of a bank closest to their homes so that they can have face to face interaction and convenience was also one factor to choose banks but customers face problems as they have low access to their own banking information when they are travelling. So looking after the satisfaction of the customers and to remain in the competitive market traditional banks have started internet banking in their services. Online banking provide customers several benefits like their balances, transfer money, open new accounts. This has overcome with inconvenience faced by the customers to visit bank and stand in a queue. Though convenience sometimes cost a price. Digital banking has also created cybercrimes.

#### **Conclusion:**

If an organisation wants to grow then it is necessary to bring change in the working of organisation. Similar is with the most prominent financial institution banks which have changed from traditional way of working to the modern banks by providing more facilities to its customers and thus has increased more growth and customer satisfaction. One of the modern way of working include e- banking which has opened a new window for growth in banking sector which were not present in traditional banks but due globalisation competition regarding online banking has increased in banks. Also to attract and retain customers every bank is seeking new innovative

ideas related to technology. Therefore there is more focus on internet banking which has created a revolutionay change in the banking industry. Though there are many advantages of internet banking , there are some concerns and inconveniences of which users should be aware of and there are some problems which they face while undergoing internet banking.

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## **A study of profitability of I. T. Companies in India**

\* Gathani Nirali S.

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***Abstract-** A key goal of each and every organisation is to earn maximum profit to develop its business and to upgrade its level in the market. Each and every activity done by the company is based only and only to earn maximum profit. Hence, to know and measure the profit position rather we can say the profitability position some ratios are used. Each ratio has its own measurement and use. Some of the profitability ratio are net profit ratio, gross profit ratio, operating expense ratio etc.*

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**Key Words-** Net profit ratio, Gross profit ratio, Operating profit ratio etc.

**Introduction:** Every business firm's main aim is to maximize profits out of the capital invested. The success of the company is usually resulted from its profits earned and the profitability situation, keeping the liquidity prospects in view. In reality, it is a difficult task to tradeoff between the liquidity and profitability, as the conservative policy of working capital may ensure sound liquidity but endangers the profitability. On the other hand, aggressive policy helps in making profits but the liquidity is not promised to have the same. Before deciding on an appropriate level of working capital investment, a firm's management has to evaluate the tradeoff between expected profitability and the risk that it may be unable to meet its financial obligations. (Dr. Reddy, 2015)

**Objectives:**

- To study the profitability of sample.
- To provide a reference to the future researchers.

**Scope Of The Study:** The study can be expand up to each and every companies registered under companies act in the world. Other industry's companies can also be taken for the study. Also other ratios can also be taken for the study.

**Sample Size:** The researcher has taken two I.T. companies to analyse the profitability and the five years data has been collected from 2012-13 to 2016-17.

**Data Collection:** The researcher has collected secondary data for this research. The data has been collected from annual reports, articles, books, journals etc.

**Ratio Analysis:** For studying the profitability of the sample companies, the researcher has used three ratios by which the profitability can be studied. The

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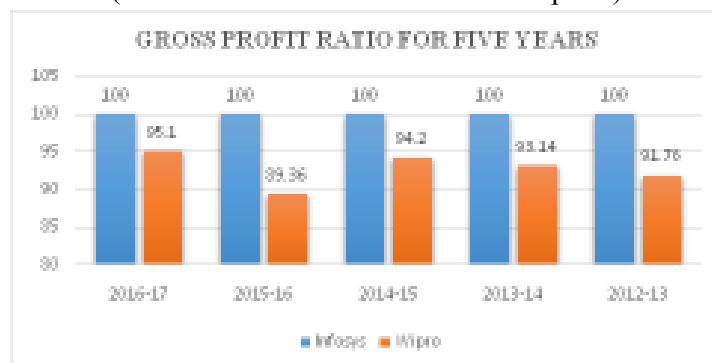
\* Ph.D. Research Scholar, Saurashtra University, Rajkot, Gujarat, India

ratios are Net Profit Ratio, Gross Profit Ratio, and Operating Expense Ratio.

**Table: Gross Profit Ratio for Five Years**  
(Amount in percentage)

Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	100.00	100.00	100.00	100.00	100.00
Wipro	95.10	89.36	94.20	93.14	91.76

(Source: Calculated from Annual Reports)

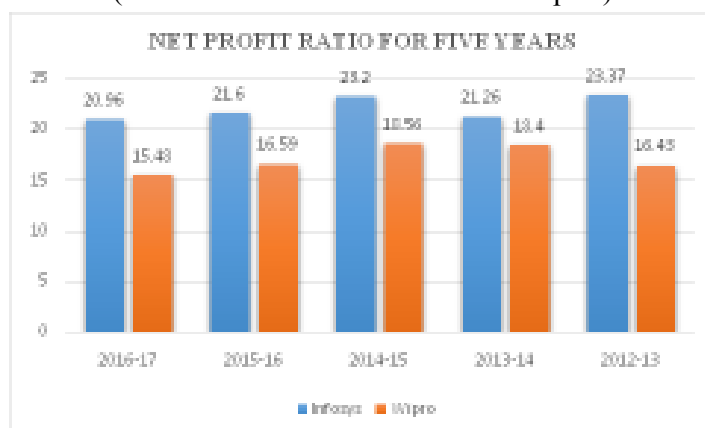


**Interpretation:** The above table and chart reveals the data regarding gross profit ratio of Infosys and Wipro for five years. It can be seen that in Infosys there are no any purchase or purchase related expenses generated in the five years as the profit shows 100% in every year. In Wipro the gross profit in nearer to 90% in every year which shows good condition of the company. As more as the percentage of this ratio is there in company, that much sound position is there of the company.

**Table: Net Profit Ratio for Five Years**  
(Amount in percentage)

Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	20.96	21.60	23.20	21.26	23.37
Wipro	15.48	16.59	18.56	18.40	16.43

(Source: Calculated from Annual Report)



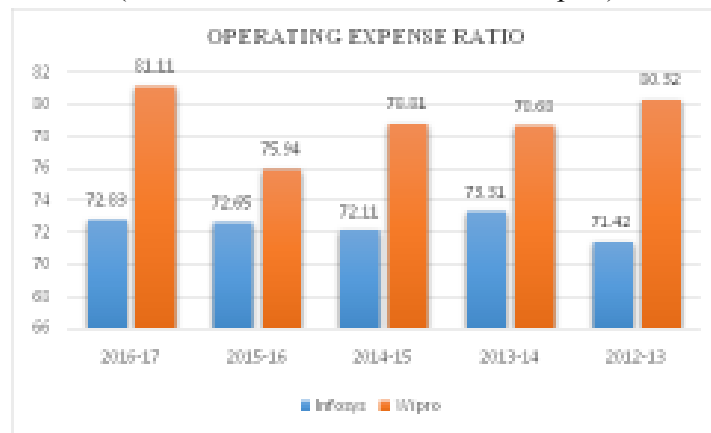
**Interpretation:** The above table shows the data regarding net profit ratio of

the companies for five years from 2012-13 to 2016-17. The net profit in both companies fluctuated every year. The comparison of two companies shows that the net profit of Infosys is more than the Wipro. As high as the profit, better condition will be there. There is no any ideal measurement for net profit ratio.

**Table: Operating Expense Ratio for Five Years**  
(Amount in percentage)

Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	72.83	72.65	72.11	73.31	71.42
Wipro	81.11	75.94	78.81	78.68	80.32

(Source: Calculated from Annual Report)



**Interpretation:** The above table shows the data regarding operating expense ratio of two companies for five years. This ratio is to be found out by deducting sales with operating expenses and multiplied with 100. The ratio shows the percentage of operating expenses in the company. The higher percentage is unfavourable for the company. And the lower percentage of the ratio is good for the company. The ratio is fluctuating in both the companies in every year.

**Conclusion:** It can be concluded that to maintain sound profit position in a company, every ratios of profitability should be sound with its rules. The profit should be increase to have the proper profitability position of the company. Here, both the companies have good position of profit and profitability in the five years.

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## Consumption of Tea in Professionals and Non-professionals

\* Renuka Mayuri B.

\*\* F.C. Shastri

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***Abstract-** Tea is an important part of our daily life and culture. People consume it for refreshment especially during breakfast or after breakfast. It tastes good and is the cheapest drink consumed worldwide. It contains fluoride which is very helpful in our physiological and some of the pathological conditions. It also contains caffeine, which is a CNS stimulant and causes addiction of it. Now it has become a need for its users due to its addiction. Our study aimed to find out its consumption and its addiction in different age groups and genders belonging to different professions. A percentage method was used to collect data from different offices and other public places in Vadodara city. According to our survey tea consumption is prevalent among all age groups. 2-3 cups of tea is the mostly consumed amount of tea. People mostly consume 2-3 cups of tea daily. The consumption of tea is more prevalent in males than in females. It causes addiction so the common symptoms found in people were headache and sedation. Tea consumption in the professional class is greater as compared to the non-professionals. While some other consume tea but they are not addicted of it.*

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**Key Words- Consumption; Tea; Addiction; Professionals; Non-professionals**

**Introduction:** Tea is the agricultural product of the leaf buds, leaves, and internodes of many cultivars and sub-varieties of the *Camelliasinensis* plant, and is processed and cured using various methods. The aromatic beverage prepared from the cured leaves by combination with hot or boiling water, is also referred to as tea. Tea is the common name for the *Camellia sinensis* plant itself. Tea, is the world's most favoured beverage; as it is a generally acceptable drink, with lots of benefits, and is comparatively cheaper than other beverages. After water, it is the second drunk beverage in the world. Its plant originated from South East China and slowly spread to India, Pakistan and other countries. Tea contains fluoride which prevents dental decay. It also prevents the deposition of cholesterol on the artery wall, which in turn can help avoid heart disease. Tea is also useful in combating bacterial diseases of

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\* Ph. D Research Scholar, Department of Commerce, Saurashtra University, Rajkot, Gujarat, India

\*\* Principal, Smt. H. B. Jasani Arts & Shri N.K. Jasani Commerce College, Rajkot, Gujarat, India

the intestines because it has been found to contain compounds which prevent multiplication of bacteria. Tea is also useful in the control of diseases caused by radiation. Tea drinking is a long tradition in India which has now become an integral part of our social life. After China, India is the Second biggest producer of tea in the world with annual production hovering 1,279 million kg in 2017. Consumption of tea in the country is increasing day by day with the increase in population. In India has a market of 27.4 million kg for tea, which, it imports from 21 different countries of the world International quality regulation, only approved Black tea. Fluoride and aluminium have also been found to occur in tea, due to modern day environmental pollution with certain types of brick tea made from old leaves and stems having the high levels. Caffeine is an addictive drug and overuse of tea may result in harmful adverse effects, like increased likelihood of certain sleep disorders.

**Methodology:** A survey was conducted for the collection of data about the common tea consumption practice in professionals and non-professionals in Vadodara City. Data were collected from different public places, offices, college, and hospitals in Vadodara city. A specially designed questionnaire was used for data collection. Data from 50 professionals and 50 non-professionals were collected. Different questions were asked from the professionals and non-professionals belonging to different age groups and genders like how much tea (in cups) they consumed each day? Why they take tea? How they feel if they don't take tea? The questionnaire was designed in order to check the daily consumptions and addiction of tea in non-professional people and people belonging to different professions.

**Table 1: Consumption of Tea**

Age Group	1 CUP		2-3 CUP		4-5 CUP		Total
	Prof.	Non-Prof.	Prof.	Non-Prof.	Prof.	Non-Prof.	
25-30	10	6	12	4	5	2	39
31-35	3	1	5	1	2	1	13
36-40	1	0	3	1	1	0	06
41-50	5	1	9	2	1	1	19
51-55	3	1	2	1	1	1	09
56-60	2	1	7	2	1	1	14
<b>Total</b>	<b>Total</b>						<b>100</b>

**Table 1:** According to survey, 100 people were asked question about their tea drinking habits. There are 6 Age Group like 25-30 to 56-60. Total Professionals and Non-Professionals people are divided as per drinking of tea habits in per day, which is 1 cup, 2-3 cups and 4-5 cups. Here, as per this table we can say that Age group of 25-30 consumes more tea than 31-35, 36-40, 41-50, 51-55 and 56-60 respectively. Age group 25-30, in those professionals' consumes more tea per day than other age group of people.

**Table 2: Gender wise Classification**

Gender	1 CUP		2-3 CUP		4-5 CUP		Total
	Prof.	Non-Prof.	Prof.	Non-Prof.	Prof.	Non-Prof.	
	Male	14	05	26	03	07	
Female	10	03	15	05	09	02	44
<b>Total</b>	<b>Total</b>						<b>100</b>

**Table 2:** As we seen in table, in Gender wise classification that are Male and Female who consumes 1 cup, 2-3 cups, and 4-5 cups as a Professionals and Non-professionals. Total percentage of Male is 56% and Female is 44% through that data researcher can say that Male and whose belonging to professionals category consumes more tea (2-3 cups per day) than Female and Non-professionals.

**Table 3: Symptoms of tea addiction**

Symptoms	1 CUP		2-3 CUP		4-5 CUP		Total	
	Symptoms	Prof.	Non-Prof.	Prof.	Non-Prof.	Prof.		Non-Prof.
	Normal	09	07	06	03	05		04
Headache	09	05	11	04	06	03	38	
Sedation	04	02	05	03	07	01	22	
Others	00	01	02	01	01	01	06	
<b>Total</b>	<b>Total</b>						<b>100</b>	

**Table 3:** Symptoms of drinking tea are mainly two: 1) Headache 2) Sedation, In other group Normal and other symptoms are covered. After collecting of data researcher can analyse that, which have Headache and professional People, They consumes 2-3 cups tea per day. This is more than any other symptoms. A total 38% person who suffers from headache, they consume tea for that solution. From survey, result for sedation is quite different; 4-5 cup per day and professional people consume 7% of tea. 2-3 cup per day and suffers from sedation consumes 5% at and researcher can conclude that 22% people believes that tea consumption is drug for sedation. 34% people consume tea without any symptoms.

**Table 4: Consumption of tea in professionals & Non-professionals**

	1 CUP	2-3 CUPS	4-5 CUPS	Total
<b>Professionals</b>	18	20	12	50
<b>Non-Professionals</b>	16	19	15	50
<b>Total</b>	<b>Total</b>			<b>100</b>

**Table 4:** The main base of this paper is to check professionals and non-professionals people's daily consumption habit of tea. The survey revealed that who consumes 1 cup per day in that 18 professionals and 16 are non-professionals are includes. However, the researcher can say that, total 34% consumes 1 cup per day, 39% consumes 2-3 cup per day in that 20 professionals and 19 non- professionals. 27 persons who consumes 4-5 cups per day, 12 comes from professionals and 15 persons come from are non-

professionals. So, researcher can conclude that habits of drinking tea in professionals are more in compare to non-professionals.

**Data Analysis:** We have used tables and figures representation for the statistical analysis of data obtained.

**Discussion:** Tea is a cheap beverage, and is commonly consumed all around the world. We survey 100 people, to check tea consumption across different age groups, genders, and professions. It is also consumed as a part of breakfast, in Indian culture. People also drink tea, as they enjoy its good taste. People who are addicted to tea feel symptoms like sedation, headache, tiredness, fatigue, drowsiness etc, if they don't take tea. Some people are not addicted to tea and they use it very less, so they may even feel relaxed without consuming tea. Tea is used in people of different age groups belonging to different professions.

**Results:** According to our survey, 39% people belonging to different age groups and different professions consume tea. Our analysis also revealed that male consumes more tea than females. We analyzed that tea caused addiction in many users so they experience headache and sedation, if they don't take tea. We also analyzed that professionals (males and females) consume more tea than that of non-professionals.

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## Study of Growth Trends of Retail Industry in India

\* Atul Dubey  
\*\* Mohit Virmani

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**Abstract-** *Indian retail industry is one of the fastest growing industries in the world. The retail development is taking place not only in metropolitan cities but also in Tier II and Tier III cities. India retail has undergone tremendous change since last decade. Emerging rural markets, changes in technology, rise of consumerism are some of the factors that have contributed to the growth of retail industry in India. The main driver was continuous increase in GDP. Thus, the Indian retail industry has got ample opportunities to flourish. Today due to retail business the idea of shopping has undergone a major change. The first decade of modern retail in India has been characterized by a shift from traditional kirana shops to new formats. Modern retailing has entered the country providing more benefits to the retailers and great shopping experience to various customers. This paper provides detailed information about the growth of retailing industry in India. It aims to study organized retail formats in India. It also examines the growing awareness and brand consciousness among people across different socio-economic classes in India and how the urban and semi-urban retail markets are witnessing significant growth.*

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**Key Words- Organized retail, markets, retailers**

### Literature Review:

**Sinha and Kar (2007)** The authors investigated modern retail developments and growth of modern formats in India. They also discuss the challenges and opportunities available to the retailers to succeed in this country. Retailers should create value for the consumer and must decide suitable vehicle to deliver desired consumer value. Retailers need to find out what matches consumer requirement and offer better than the competitors. Retailers certainly need to be innovative in designing the value proposition and deciding the format to deliver that to the consumer.

**Anand and Sinha (2009)** reported that though there is an extreme transition in Indian retail format, only five (5 percent) percentage of overall retail market has been occupied by organized retail sector. Open market, sandy, street shops and grocery store are the major segments of the retail market in India. Further they have also explained that the customer's priorities are being changed

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\* Professor & Head, Shri Ram Institute of Technology (MCA & MBA) Dean Faculty of Management, BOS (Management) RDVV, Jabalpur

\*\* Assistant Professor Shri Ram Institute of Management, Near ITI Madhotal, Jabalpur (MP)



with respect to the availability of the retail formats. So it is difficult to predict the attitude of the shoppers. As an example, the customers may visit grocery shop either for bulk or small purchase.

Sinha, P. K., & Kar, S. K. (2007). An insight in to the growth of New retail formats in India. Indian Institute of Management Ahmedabad.

Anand K.S. and Sinha P.K. (2009) , Store format, choice in an evolving market: role of affect cognition and involvement. International Review of Retail, Distribution and Consumer Research, 19(5), pp. 505- 534.

**Kusuma, Prasad, & Rao (2013)** This paper deals with various retail formats and the opportunities for the growth of retail industry in India and also provides some suggestions to overcome the challenges. Challenges to retail development in India are as follows: Retail is not recognized as an industry in India, high cost of real estate, high stamp duties, lack of adequate infrastructure, price war between different retail organizations, shortage of skilled manpower, policy induced barriers, supply channel conflicts and unique character of Indian consumers.

**Rawat (2013)** The growth of the organized retail industry in the country creating thousands of new jobs, increasing income levels and living standards, better products, and services, a better shopping experience, and more social activities. Indian retailing opening doors for foreign retailers is seen as a threat for Indian unorganized retailers. The regulatory body and the government have to take care of the unorganized retailers and can make regulation to prevent foreign retailers like Wal-Mart from having a high concentration of business in the country.

**Vij, M. (2013)** The broad objective of the study is to understand consumer behavior towards organized and unorganized retail stores and to find out the consumers satisfaction level from organized retail stores as well as unorganized retail stores. The key findings are as follows: Organized retailers operate in the vicinity of unorganized traders affected the latter adversely in terms of their volume of business and profit.

Competitive response is one of the factors that help the unorganized traders to overcome the adverse impact. Consumers are the gainers due to the availability of better quality products at lower prices, one stop shopping, and choice of additional brands, family shopping and fresh stock. The study concludes that the values, culture and beliefs of the customers prompt them to go to the small retail shops, where they get the product required at low price and less waiting time.

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unorganized retail in India. EXCEL International journal of organized retail on unorganized retail in India, Vol.3(7). Rawat, H. N. (2013). Indian Retail Industry.

**Introduction:** Retailing consists of selling merchandise from a permanent location in small quantities directly to the consumers. These consumers may be individual buyers or corporate. In the world of Trade and Commerce, a retailer purchases goods or merchandise in bulk from manufacturers directly and then sells in small quantities are known as Retail stores or shops. The Retail Industry in India has emerged as the most dynamic and fast paced as new players are entering the markets. Retailing can be divided into organized and unorganized sector.

**Organized Sector:** The total concept and idea of shopping has undergone a drastic change in recent years. Modern retailing has entered into the Indian retail market. The growth of organized retail sector is a result of higher growth in Indian economy, which has resulted in greater purchasing power among the Indian population. Factors like knowledgeable consumers, huge investments by venture capitalist and entry of retail giants have also contributed to the growth of Indian retail sector. However the government of India has laid few restrictions because of which there is a hindrance in getting a license to start a retail outlet.

**Unorganized sector:** In India the unorganized sector remains dominant as it enjoys many advantages. The major advantage is the low operating cost and less investment required as it directly creates an impact on the pricing of the products. The unorganized retailers are offering great opportunities for modern retailers for opening stores in rural areas.

There is a huge change in life styles, income and demographic variables in Indian democracy in recent times. This has resulted in huge impact on organized retailing.

The Indian retail industry is playing vital role in the economic growth of the country. The shopping concept is moving in and around hypermarkets, supermarkets, and specialty stores and in other formats.

The factors like changing life style, constraint of time, heavy traffic on the roads, increase in disposable income has led the way for new types of retail formats. Getting the right product at right time at lowest possible cost is an advantage of consumers in the edge of retail transformation. Organized retailing in India is still finding its place to fit in. Though the organized retailing trade makes up over 70-80% of total trade in developed economies but in country like India the share is very minimal.

**Objectives :**

- 1) To study organized retail formats in India.
- 2) To study various challenges of retail industry in India.
- 3) To study growth trends of retail.

**Organized Retail Formats in India:**

In India, the retail business is growing and there are a number of retail formats. Following are the various organized retail formats in India :

1. **Mom-and-Pop Stores** : These are small family-owned businesses. They usually have a small amount of business volume. They cater to small sections of the society.
2. **Department Stores** : These are large retail establishment with an extensive range of goods. They offer to the customers mid- to high-quality products. For example – Westside and Lifestyle are popular department stores in India.
3. **Malls** : Malls provide everything that a person wants under one roof. It is one of the most popular retail formats in India. Malls provide various accessories, food, clothes and try to satisfy the needs of the masses. For example -Spencers Plaza in Chennai, or the Forum Mall in Bangalore.
4. **Discount Stores** : It is a retail shop that sells products at a low price than the typical market price. A discount store is also known as discount shop. With half of the country's population under 25 and two-thirds under 35, the knowledge and aspiration for international brands is on the rise. For example - Pantaloon Retail (India) Ltd's Brand Factory, Arvind Mills Ltd's Megamart, Vishal Megamart, the discount store chain of Vishal Retail Ltd, and Provogue (India) Ltd. Are some of the prominent players.
5. **Supermarkets** – A Supermarket is an organized self-service shop offering a variety of food and household items. They generally offer a huge variety of products. They also provide products at reasonable prices and of mid to high quality. For example – Big Bazaar, Central, D-Mart and Croma are some popular supermarkets in India.
6. **Hypermarkets – It is the combination** of supermarket and department stores. These are large retailers that provide all kinds of groceries and general goods. For example – Reliance Fresh, Spencer's Hyper and Star Bazaar are some popular hypermarkets in India.

The Retail industry in India has shown an upward trend in different formats of retailing. Modern retailing in India has entered in form of huge malls and super markets. Some other formats include discount stores, supermarkets, hypermarkets to specialty chains. However, kirana shops still continue to score over modern formats primarily due to the convenience factor.

It is to be noted that over the past few years, many prominent players in the country like Tata, Reliance Industries, Aditya Birla and many others are investing significantly in the Indian Retail market as a result of which there has been a tremendous growth in the organised segment. Many other progressive players stepped into the territory with long term goals to expand their business across verticals, cities, formats and segments.

The organized segment typically comprises of a large number of retailers, greater enforcement of taxation mechanisms and better labour law monitoring system. Retailing is no longer only stocking and selling but is

about efficient management of supply chain, developing distributor and vendor relationship, customer service quality, efficient merchandising and timely promotional campaign.

**Challenges of Retail Industry in India:** There are various challenges associated with retail industry in India. These can be enumerated as follows:

**1) Cultural Diversity:** The biggest challenge for Indian retail industry is that there is no established model or consumption pattern throughout the country.

Thus, due to cultural diversity various retailers and manufacturers have to devise strategies for different sectors.

**2) International Standards:** Various Indian companies and International brands have a huge role to play as far as international standards are concerned. Although India has more than 5 million retail outlets of various styles still it has a long way to go to match various International Standards.

**3) Inefficient Supply Chain Management:** This is another important challenge for Indian retail industry. Indian retailing is still dominated by the unorganized sector. A poorly managed inventory can cause supply chain design problems. India must concentrate on improving the supply chain management, which in turn would bring down inventory cost.

**4) Lack of Retail space:** Luxury foreign brands are finding it difficult to enter the Indian retail market. Most of the retail outlets in India have outlets that are less than 500 square feet in area. Lack of quality space may prove to be a barrier for retail trade.

**5) Human resource problems:** Another challenge of retail is associated with the scarcity of trained manpower. Thus, retailers are not able to hire trained and experienced manpower. Even if they hire then they have to pay them more as they are skilled and talented. This further reduces the profit levels of Indian retailers.

**6) Frauds in Retail:** In retail trade the number of frauds is gradually increasing. This includes shoplifting, thefts and vendor frauds despite of the fact that different security techniques are at proper place like CCTVs and POS systems. As the size of the industry would increase, this would further enhance the number of frauds and discrepancies in the system.

**7) Challenges with Infrastructure and Logistics:** If we talk about retail trade then the biggest challenge is our infrastructure. Our infrastructure is not at all appropriate as compared to international standards. We also face major problems associated with logistics management. This results in inefficient processes.

**8) Competition from unorganized sector:** There is cut-throat competition between organized and unorganized retail trade in India. Various reports show that our unorganized sector constitutes a whopping 94% of the total retail sector. Despite of this fact there has been a lack of recognition of retail segment as an industry from government fronts.

**Growth Trends of Retail in India:**

- 1) In the present scenario, India is attracting various investors across the globe. According to experts, India's latest FDI policy will definitely help us in the long run. Government of India has allowed 100% Foreign Direct Investment (FDI) in online retail of goods and services through the automatic route, thereby providing clarity on the existing businesses of e-commerce companies operating in India.
- 2) Due to easy availability of loans and credit facilities there has been an increase in the purchasing power of the consumers. The consumers are showing willingness to purchase various goods and services which they haven't been used as yet. In other words, there has been a paradigm shift in the mindset of consumers. There has been a positive change when it comes to their buying pattern and more importantly they have become more educated. Thus, changing lifestyles and significant growth in discretionary income of the consumers are among the major growth drivers of Indian retail industry.
- 3) E-commerce is probably the biggest revolution in retail industry. The Indian e-commerce industry has been on an upward growth trajectory and is expected to surpass the US to become the second largest e-commerce market in the world by 2034. The best part is that customers now have a variety of products to choose from and that too at reasonable price. Rising internet penetration is expected to drive ecommerce growth in India.
- 4) Mobile technology has also changed the way consumers interact. In the present scenario, majority of Indian retailers are trying to move in the direction of empowering their store associates with mobile solutions. Beyond various personalized services, Indian retailers are also providing hassle-free and on-the-spot payments thereby enriching customers' experience. In this way retailers are providing services to the customers efficiently and effectively.
- 5) Retail and technology will become inseparable. In 2018, evolving technology in the retail industry will be instrumental in enticing customers into physical stores and in creating seamless omnichannel shopping experiences. Retail technologies will be used by big as well as SMEs to enhance consumers shopping experience. It is expected that SME's will roll out loyalty applications, customer displays and other solutions to add more value in consumers shopping experience.
- 6) In India, the rural markets are also emerging very fast. The reason behind the growth of rural markets is that the spending power of rural consumers have increased considerably. Moreover, rural consumers are becoming quality conscious. This is forcing big companies to flock to rural markets. Various MNC's and corporate giants are developing new products and services to suffice the need of rural consumers. Thus, in India, retail industry is proving the country's largest source of employment after agriculture, which has the deepest penetration into rural India.
- 7) Various trends indicate that specialty stores will be more conducive

than departmental stores. One of the most important benefit of a specialty store is that it focuses on a single class of products. Specialty stores tend to develop direct relationship with their customers. These stores also aim to provide more personalized services to their customers.

8) With the emergence of consumerism, the retailer faces a more knowledgeable and demanding consumer. More consumers are asking questions about the products they buy. Thus growing expectation of the consumers has forced the Indian retailers to change their format of retail trade. Due to the emergence of consumerism, various Indian companies are constantly trying to provide superior quality products and services to the consumers.

**Conclusion:** Retailing in India is the most dynamic industry, which represents huge opportunities for both organized and unorganized players. The major opportunity and challenges for both organized and unorganized retailers remain same as they see each other as their biggest threat. There would be a win-win situation for both if they mitigate the challenges and leverage on the opportunities that could benefit both sectors. It would be tough to handle all the opportunity and challenges factors all at once.

To enhance the growth the organized retailers needs to adopt strategies with respect to investment in technology and in supply chain management. Investment in technology would reduce their wastage of time, goods and efforts. There should be a strong networking between retailers for the use of technology and should also pressurize other channel members including suppliers to adopt compatible technology.

The government should also ensure a single window clearance for retail chain and permit FDI in retail in different phases. . Government can encourage PPP model for infrastructural development it can also ensure flexibility of labour laws thereby ensuring the availability of skilled workforce for organized retailing. Retail marketing has been considered as a race without the finish time.

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## **Entrepreneurial Economic Growth of India under innovative leadership of Narendra Modi**

**\* Prakash Kumar Pathak**

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***Abstract-** Economic growth depends on will power of ruling government of the country. We are having a strong determined government with solid will power. India is making good ranking year by year in World Bank ranking of countries having ease of doing business. The Key person behind Skill India is Sri Dharmendra Pradhan. Skill India includes various initiatives of the government like, "National Skill Development Mission", "National Policy for skill Development and Entrepreneurship 2015", " Pradhan Mantri Kaushal Vikas Yojana (PMKVY)", "Skill Loan Scheme" "Rural India Skill." The key person behind Start up India is Sri Suresh Prabhu. The action plan of this initiative is based on the following three areas:-*

- 1. Simplification and Hand holding.*
- 2. Funding Support and Incentives.*
- 3. Industry-Academia Partnership and Incubation.*

*The event was launched on 16 Jan' 2016 by Finance Minister Arun Jaitley. The key people behind 'Digital India' are Sri Ravi Shankar Prasad and Sri S. S. Ahluwalia. Pace of engine of economic growth of any country solely depends on entrepreneur's activism. NDA II government took it seriously and several significant measures were taken into action -such as- Skill India, Start up India, Make in India, Digital India etc. Modi Government ignited along said line and now a day it is evident that India is sixth largest economy in the world. India is having higher rank in comparison with France and Italy.*

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**Key Words-** Endeavours, enthusiastic growth, will-power, Asia pacific, Stand up India, Skill India, Digital India, Make in India, Key person, Apprenticeship, Craftsman, Visionist approach.

**Introduction:** Entrepreneurs are hub of industries in any country. Now a day job creation is more important than to get the jobs which became virtually non- existent already. NDA II Government made endeavours to enrich entrepreneurs for speedy national growth. P.M. Sri Narendra Modi has taken several innovative steps like Stand up India, Skill India, Digital India, Make in India etc. for making enthusiastic growth in industrial sector. Now we are a fast growing industrial giant in Asia pacific and in the world as well. Economic growth depends on will power of ruling government of the country.

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\* Ph.D. Scholar, TMBU Bhagalpur, Bhagalpur, Bihar. Pin-812002

We are having a strong determined government with solid will power. India is making good ranking year by year in World Bank ranking of countries having ease of doing business.

**Skill India:** Skill India is a campaign launched by Prime Minister Narendra Modi on 15<sup>th</sup> July 2015, which aims to train over 40 crores people in India in different skills by 2022. The Key person behind Skill India is Sri Dharmendra Pradhan. Skill India includes various initiatives<sup>1</sup> of the government like, “National Skill Development Mission”, “National Policy for skill Development and Entrepreneurship 2015”, “ Pradhan Mantri Kaushal Vikas Yojana (PMKVY)”, “Skill Loan Scheme” “Rural India Skill.”

National Skill Development Mission is based on to

- (1) Create Large and good quality vocational institutes
- (2) Reduce risk by providing patient capital including grants and equality.
- (3) Enable the creation and sustainability of support systems required for skill development.<sup>2</sup>

Schemes for the skill development launched by Govt. of India-

1. Deen Dayal Upadhaya Grameen Kaushalya Yojana.
2. Pradhan Mantri Kaushal Vikas Yojana.
3. Financial Assistance for Skill Training of persons with disabilities.
4. National Apprenticeship Promotion Scheme.
5. Craftsman Training Scheme.
6. Apprenticeship Training.
7. Pradhan Mantri Kaushal Kendra.
8. Skill development for Minorities.
9. Green Skill Development Programme.<sup>3</sup>

#### **Recent Developments along “Skill India”**

Oracle on 12 Feb. 2016 announced that it will build a new 2.8 million sq.ft. Campus in Bangalore<sup>4</sup>. Japan’s private Sector is to set up six institutes of manufacturing to train 30,000 people over 10 years in Japanese styled manufacturing skills and practices. The first three institutes would be set up in Gujarat, Karnataka and Rajasthan in the summer of 2017<sup>5</sup>. Keeping the promise, Japan-India Institute is functioning in Mehsana, Gujarat. 254 Students of first batch of Japan-India Institute Mehsana got certificates on July 04 2018 in ‘Certificate Ceremony’ organized by Maruti Suzuki India Limited along with Ganpat University Mehsana, Gujarat.(www.marutisuzuki.com) Government of Japan selected Toyota Kirloskar Motor for the ‘Manufacturing Skill Transfer Promotion Programme’ to further boost Prime Minister Narendra Modi’s ‘Skill India’ initiative. Toyota Kirloskar Motor inaugurated the Toyota Centre of Excellence at the Global Academy of Technology in Bangalore on 20 November 2018.(www.autocarpro.in) In the budget of Fiscal year 2017-18 the Government of India has decided to set aside Rs. 17000 Crore, the highest ever allocation to this sector in order to boost the skill India Mission. The government has invested Rs. 4000 crores in the launch of



SANKALP (Skill Acquisition and knowledge Awareness for Livelihood Promotion) Programme. Apart from this the government would set up 100 India International skill centres, that will conduct advanced courses in foreign languages which will help youngsters to prepare for overseas jobs.<sup>6</sup>

#### **Start up India:**

The Campaign was first announced by P.M. Narendra Modi during his 15<sup>th</sup> August 2015 address from the Red Fort, in New Delhi.<sup>7</sup> The key person behind Start up India is Sri Suresh Prabhu. The action plan of this initiative is based on the following three areas:-

1. Simplification and Hand holding.
2. Funding Support and Incentives.
3. Industry-Academia Partnership and Incubation.

The event was launched on 16 Jan' 2016 by Finance Minister Arun Jaitley.<sup>8</sup> Start up India initiative brought a sea change in Economic scenario of urban area and rural area as well.

#### **Recent developments along start up India:**

Kerala has initiated a government startup policy called "Kerala IT Mission" which focuses on fetching Rs. 50 billion in investment for the State's startup ecosystem. Telanga has launched the largest incubation centre in India as "T-Hub". Andhra Pradesh has allocated a 17000 sq.ft Technological Research and Innovation Park as a Research and Development Laboratory. The Govt. of Madhya Pradesh has collaborated with the Small Industries Development Bank of India (SIDBI) to create a fund of Rs. 250 crore. Rajasthan has also launched a "Start-up Oasis" scheme. In order to promote start-ups in Orissa the State Government organised two-days start-up conclave in Bhubaneswar on Nov28' 2016. The Union Ministry of Human Resource Development has announced plans for the development of "Research Parks" to be created in partnership with higher education providers across India. An initial investment of Rs. 100 crore has been set aside for the programme which aims to provide students with access to funds and mentorship for startups.

#### **Standup India:**

Standup India was launched by Prime Minister Narendra Modi on 5 April 2016 to support entrepreneurship among women and SC & ST Communities. Stand-up India Scheme is enabler and beneficiary of Government of India schemes such as Make in India, Industrial Corridor, Dedicated Freight Corridor, Sagarmala, Bharatmata, Digital India, Bharatnet and UMANG (Unified Mobile Application for New-age Governance). The Standup India Scheme Offers bank loans between Rs. 10 lakh and Rs. 1 crore for Scheduled Castes and Scheduled Tribes and women setting up new enterprises outside the farm sector<sup>9</sup>.

#### **Digital India:**

‘Digital India’ was launched by the Prime Minister of India Narendra Modi on 1 July 2015 with an objective of connecting rural areas with high-speed internet networks and improving digital literacy.<sup>10</sup> The key people behind ‘Digital India’ are Sri Ravi Shankar Prasad and Sri S. S. Ahluwalia.

National e-Governance plan aimed at bringing all the front-end government services online. My Gov.in is a platform to share inputs and ideas on matters of policy and government. UMANG (Unified Mobile Application for New-age Governance) is a Government of India all-in-one single unified secure multi-channel, multi-platform, multi-lingual, multi-service free-ware mobile app for accessing over 1,200 Central and State Government services in multiple Indian languages.<sup>11</sup> e-Sign framework allows citizens to digitally sign a document online using Aadhaar authentication.<sup>12</sup> Digital attendance was facilitated by Government of India by launching attendance.gov.in on 01 July 2015 by P.M. Narendra Modi. It is an app to keep a record of the attendance of government employees on a real-time basis. This initiative was started with implementation of a common Biometric Attendance System (BAS).<sup>13</sup> Govt. of India has facilitated Digital locker facility which helps citizens to digitally store their important documents like PAN Card, passport, mark-sheets and degree certificates.<sup>14</sup> Digital locker provides secure access to Government issued documents. It uses authenticity services provided by Aadhaar. e-Sampark-a vernacular email service- is another facility to activate persons of vernacular languages through e-mails in those diverse languages. To connect rural India using vernacular languages, with the Digital India, the Government of India motivates email service provider giants including Gmail office and Rediff to provide the email address in regional languages. The email provider companies have shown positive sign and are working in the same direction. An Indian based company Data Xgen Technologies Pvt. Ltd. has launched world’s first free linguistic email address under the name ‘DATAMAIL’<sup>15</sup> Over the period of time the email service in 22 languages will be offered by Data XGen Technologies<sup>16</sup>

These initiatives have been favoured by multiple countries including the US, Japan, South Korea, the UK, Canada, Australia, Malaysia, Singapore, Uzbekistan and Vietnam.<sup>17</sup> At the launch ceremony of Digital India week by Prime Minister Narendra Modi in Delhi on 1 July 2015, top CEOs from India and abroad committed to invest Rs. 224.5 lakh crore towards this initiative. Leaders from Silicon Valley, San Jose of California expressed their support for Digital India during PM Narendra Modi’s visit in September 2015. Facebook CEO Mark Zuckerberg changed his profile picture in support of Digital India and promised to work on wi-fi Hotspots in rural area of India. Google Committed to provide broadband connectivity on 500 railway stations in India. Microsoft agreed to provide broadband connectivity to give hundred thousand villages in India and make India its cloud hub through India data centers. Qualcomm announced an investment of US \$ 150 million in Indian startups.

Oracle plans to invest in 20 states and will work on pavements and Smart City initiatives. The Statesman reported, “Prime Minister Narendra Modi’s Chemistry with facebook CEO Mark Zuckerberg at the Social media giants headquarters in California may have been greeted enthusiastically in Silicon Valley but several social media enthusiasts and cyber activists are disappointed at back home.”<sup>18</sup>

**Make in India:** Make in India was launched on 25 September 2014 with the objective of job creation and skill enhancement in 25 sectors of the conomy.<sup>19</sup> Make in India initiative was made for transforming India into a global design and manufacturing hub.<sup>20</sup>To provide for a lead role in manufacturing sector is necessary in India’s growth process. This endeavour is to encourage Companies to manufacture their products in India with enthusiasm and dedicated investments into manufacturing. As a strategy it is the road map to respond to glocal (global+local) challenges through preparations for a world class manufacturing status.<sup>21</sup>

Make in India focuses on 25 sectors which are

- (1) Automobiles
- (2) Aviation
- (3) Biotechnology
- (4) Chemicals
- (5) Construction
- (6) Defense manufacturing
- (7) Defense exports
- (8) Electronic system
- (9) Electric machinery
- (10) Food processing
- (11) Information technology and business process management
- (12) Leather
- (13) Media and entertainment
- (14) Mining
- (15) Oil and gas
- (16) Pharmaceuticals
- (17) Ports and shipping
- (18) Railways
- (19) Renewable energy
- (20) Roads and Highways
- (21) Space and astronomy
- (22) Thermal power
- (23) Textiles and Garments
- (24) Tourism and Hospitality
- (25) Wellness and Healthcare

India jumped on 77<sup>th</sup> place out of 190 countries in World Bank’s 2018 Ease of doing business Index.<sup>22</sup> In Feb. 2017, the government appointed the

National Productivity Council to sensitize actual users and get their feedback on various reform measures.<sup>23</sup> As a result now there is competition among the States of India to improve their current ranking on the ease of doing business.

Currently Andhra Pradesh, Telangana, Haryana, Orissa, Chattisgarh and West Bengal are top six States in Ease of Doing Business ranking State wise in India.<sup>24</sup> “Zero Defect Zero Effect” slogan was coined by Prime Minister of India Narendra Modi, as essence of the Make in India initiative that manages advanced process, materials and technologies. “Make in India Week” multi-sectoral industrial event at the Mumbai Metropolitan Region Development Authority (MMRDA) from 13 Feb 2016 was attended by 2500+ international and 8000+ domestic companies, foreign government delegations from 68 countries and business teams from 72 countries and 17 Indian States. Event received over Rs. 15.2 lakh crore worth of investment commitments and investment inquiries worth Rs. 1.5 lakh crore where Maharashtra led with Rs. 8 lakh crore of investments.

### **Conclusion:**

Entrepreneurs usually represent the identity card of economy of concerned countries. Pace of engine of economic growth of any country solely depends on entrepreneur’s activism. NDA II government took it seriously and several significant measures were taken into action—such as- Skill India, Start up India, Make in India, Digital India etc. Entrepreneurs are known for an entity which takes initiatives in their own region by their own. If a country supports them to lift up in their activism, economy of that country grows automatically by default. Modi Government ignited along said line and now a day it is evident that India is sixth largest economy in the world. India is having higher rank in comparison with France and Italy. Visionist approach of Modi Government catalyzed entrepreneurs and showed landmark effect in the economy of the country as a whole.

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## A Study of Unsolved Problem on Gifted Students

\* Md. Fakhra Shayan

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***Abstract-** Gifted students who receive conflicting messages from parents, conflicting messages from parents and teachers, or conflicting messages from gifted specialists and classroom teachers may find reasons not to achieve. The research literature generally suggests six possible causes of underachievement: an initiating situation, excessive power, inconsistency and opposition, inappropriate classroom environment, competition, and value conflicts. Sometimes events in students' lives alter their achievement patterns. This might be a move to a new school or a change in the family structure. Parents and educators who are aware of these potential pitfalls can prevent or lessen their impact. Young people who experience excessive power at home sometimes have difficulty adjusting to a school environment where they have limited choices. Bestowing adult status on a child at too young an age may contribute to the development of underachievement.*

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### **Key Words- Conflict, Environment, Competition**

**Introduction:** When gifted students fail to achieve at levels commensurate with their abilities, educators and parents lament the waste of such potential. The underachievement of gifted students is not only a resource loss for the nation, but also a personal loss of self-fulfillment for the underachieving individual. When the National Research Center on the Gifted and Talented conducted a national needs assessment in 1990 (Renzulli, Reid, & Gubbins, 1991), the number one issue concerning the field of gifted education was the underachievement of gifted students. Almost 20 years later, the underachievement of gifted students continues to plague educators and parents. Determining the extent of gifted underachievement is difficult for two reasons. First, no universally accepted definition of giftedness exists. Further, disagreement surrounds how to define underachievement. Most definitions of underachievement a discrepancy between ability or potential (expected performance) and achievement (actual performances; Baum, Renzulli, & Hebert, 1995a; Dowdall & Colangelo, 1982; Emerick, 1992; Reis & McCoach, 2000; Rimm, 1997; Supplee, 1990; Whitmore, 1980). However, researchers and scholars differ in terms of how they operationalize the discrepancy between potential and performance. For instance, Emerick (1988) suggested this discrepancy might include any of the following combinations:

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\* Department of Psychology, J. P. University, Chhapra

high IQ score and low achievement test scores; high IQ score and low grades; high achievement test scores and low grades; high indicators of intellectual, creative potential and low creative productivity; or high indicators of potential and limited presence of appropriate opportunity for intellectual and creative development. However, the subpopulations of students identified using these different discrepancy definitions are likely to be radically different. This example helps to illustrate the difficulties surrounding the multiple definitions and operationalizations of giftedness and underachievement.

**Observation:**

Underachievement tends to appear in middle school and often continues into high school (Peterson & Colangelo, 1996). Peterson and Colangelo examined the school records of 153 gifted students and analyzed trends in their achievement throughout their secondary school careers. In their study, 45% of the students who were underachieving in grade 7 continued to underachieve throughout junior high and high school. Peterson (2000) later conducted a follow-up study of these achievers and underachievers 4 years after high school graduation. High school and college academic achievement were strongly related ( $r = .64$ ). All of the achievers in her study attended college, and 83% of the achievers finished 4 years of college. In contrast, 87% of underachievers attended college; only 52% finished 4 years.

In the largest longitudinal study of underachievers conducted to date, McCall, Evahn, and Kratzer (1992) found those 13 years after high school, the educational and occupational status of high school underachievers paralleled their grades in high school, rather than their abilities. They also found that underachievers were less likely to complete college and remain in their jobs.

Underachievement can occur when gifted students do not receive the support and educational services they require to develop their talent. Gifted students of poverty and students from underserved groups are particularly vulnerable. Students who are not given adequate opportunities to develop their talents often become “involuntary underachievers.” Forty-four percent of lower income students who enter first grade in the top 10% will not score in the top 10% by the time they reach fifth grade (Wyner, Bridgeland, & DiIulio, 2007). Gifted students from higher income homes progress twice as fast as their gifted peers from lower income homes. “In elementary and high school, lower-income students neither maintain their status as high achievers nor rise into the ranks of high achievers as frequently as higher-income students” (Wyner et al., 2007, p. 5). High-achieving lower income students drop out of high school or do not graduate on time at a rate twice that of their higher income peers. They are less likely to graduate from college than their higher income peers (59% versus 77%) and less likely to attend the most selective colleges (19% versus 29%). Limited resources in their schools, communities, and families factor into the involuntary underachievement of

many students from underserved populations.

Research suggests that quality of schooling (Anderson & Keith, 1997; Baker et al., 1998) and completion of academic coursework (Anderson & Keith, 1997) appear to be significant predictors of achievement for at-risk high school students.

The completion of each additional academic course results in an increase of one eighth of a standard deviation in predicted academic achievement test scores (Anderson & Keith, 1997).

Underachievers are a fairly heterogeneous group. Although some underachievers may display low levels of characteristics associated with underachievement, other underachievers score high on measures of these same characteristics. Therefore, checklists of characteristics of underachievers have limited value. Moreover, the variability of motivational and attitudinal measures within samples of underachievers tends to be higher than the variability for comparison groups of average or high achievers (McCoach & Siegle, 2003). The large amount of variability suggests that although underachievers may share some common characteristics, they are not a homogeneous population of students. Each student may underachieve for a somewhat unique combination of reasons; therefore, it is possible that gifted underachievers may be low on only one or two of the many characteristics commonly ascribed to underachievers and may be average or even high in all other areas. Given the variability among underachievers, several researchers in the area of underachievement have proposed specific subtypes of underachievers (e.g., Heacox, 1991; Mandel & Marcus, 1995; Rimm, 1995, 1997; Siegle & McCoach, 2005).

**Research Concept:**

The research literature generally suggests six possible causes of underachievement: an initiating situation, excessive power, inconsistency and opposition, inappropriate classroom environment, competition, and value conflicts. Sometimes events in students' lives alter their achievement patterns. This might be a move to a new school or a change in the family structure. Parents and educators who are aware of these potential pitfalls can prevent or lessen their impact (Rimm, 1995).

Young people who experience excessive power at home sometimes have difficulty adjusting to a school environment where they have limited choices. Bestowing adult status on a child at too young an age may contribute to the development of underachievement (Rimm & Lowe, 1988).

Gifted students who receive conflicting messages from parents, conflicting messages from parents and teachers, or conflicting messages from gifted specialists and classroom teachers may find reasons not to achieve. Rimm and Lowe (1988) studied the family environments of 22 underachieving gifted students. In 95% of the families, one parent emerged as the disciplinarian, while the other parent acted as a protector. Often, opposition



between parents increased as the challenger became more authoritarian and the rescuer became increasingly protective. Parents of underachievers also tend to be either overly lenient or overly strict (Pendarvis, Howley, & Howley, 1990; Weiner, 1992) or may vacillate between lenient and strict.

Classrooms do not always provide intellectually stimulating environments for gifted and talented students to thrive. Many gifted students underachieve by default; they simply do not receive the academic content or instruction necessary to reach their potential. Regular classroom time often is unproductive for gifted learners. Many gifted elementary school students already know 40–50% of the material to be covered in their current grade prior to the start of the school year (Reis et al., 1993). The majority of gifted students spend 80% of their time in regular education settings instead of in specialized programs designed to meet their unique needs (Westberg, Archambault, Dobyns, & Salvin, 1993), yet 61% of classroom teachers have not received training in meeting the needs of advanced students (Robinson, Shore, & Enerson, 2007).

Students must learn to function within a competitive society; at the same time, overly competitive situations also can be detrimental. Gifted students with a fixed theory of intelligence may not wish to risk their “giftedness” by performing poorly in competitive situations. For them, not performing is less risky than performing and failing.

Finally, value conflicts between family, peers, and the school environment can limit student achievement. Negative peer attitudes often relate to underachievement (Clasen & Clasen, 1995; Weiner, 1992). Underachieving students frequently report peer influence as the strongest force impeding their achievement. In one study, 66% of high-ability students named peer pressure or the attitude of the other kids and friends as the primary force against getting good grades (Clasen & Clasen, 1995). In a national longitudinal study of secondary students (NELS:88), students with friends who cared about learning demonstrated better educational outcomes than those in less educationally oriented peer groups (Chen, 1997). Berndt (1999) measured students’ grades and behavior in the fall and spring of one academic year.

Berndt found that students seemed to more closely resemble their friends at the end of the school year than they did at the beginning of the school year; students’ grades decreased between fall and spring if their friends had lower grades in the fall. On the other hand, Reis, Hebert, Diaz, Maxfield, and Ratley (1995) found that high-achieving peers had a positive influence on gifted students who began to underachieve in high school and those peers contributed to some students’ reversal of their underachievement. As McCoach and Siegle (2008) noted in their review of literature on gifted underachievers, although peer achievement levels do relate to students’ academic achievement, it is unclear whether the choice to associate with other nonachievers is a cause or a result of gifted students’ underachievement.

**Result and Discussion:**

Although some gifted students underachieve because they have not had opportunities to develop their potential, others choose not to develop their potential. Siegle and McCoach (2002) suggested that students who underachieve may espouse one of three problematic beliefs: They do not believe they have the skills to do well and are afraid to try and fail; they do not see the work they are being asked to do as meaningful; or they believe the “deck is stacked against them” and that any effort they put forth will be thwarted. When any one of these beliefs exists, students tend not to perform well.

Students must believe they have the skills to perform a task before they will attempt it. For example, students must believe they are capable in mathematics before they will attempt a difficult math problem. If they believe that mathematics is too difficult, they are unlikely to put forth appropriate effort. Motivated students believe that they have the skills to do well in school. It also is imperative that students recognize their own role in developing these skills (Siegle, 2008). Students who believe that their abilities are not innate but have been developed are more likely to attempt challenging tasks. Gifted students are at risk for believing that their abilities are simply innate, particularly if others in their lives have not discussed their giftedness with them. Parents and teachers often are reluctant to talk with children about their giftedness. It is important for gifted children to recognize that the talents they possess are acquired, that they have something to do with acquiring them, and that they are capable of further developing these talents and even acquiring new ones. Wu (2005) noted that Chinese culture deemphasizes giftedness as an innate ability and emphasizes the concept of talent performance.

Therefore, gifted children need to take responsibility for developing their gifts.

For many students, school is not meaningful. Eccles' general expectancy value of motivation posits a value of self-regulated learning. This includes goals and beliefs about the importance and interest of the task (Pintrich & DeGroot, 1990). With this model, achievement values include the perceived enjoyment, importance, and potential usefulness of a task (Wigfield & Karpathian, 1991). When students value the goals of school, they are more likely to engage in academics, expend more effort on their schoolwork, and do better academically (Pintrich & DeGroot, 1990; Wigfield, 1994). In a study of university freshman honors students, Siegle, Condon, and Romey (2007) found that in 15 different talent areas (from leadership and musical to mathematics and writing) there was always a significant, positive relationship between students' interest in a talent area and their assessment of their skill in that area. Students who reported being interested in an area tended to do well; those with lower interest also had lower self-reported achievement.

Brophy (2008) suggested that some content is not important and

educators must do a better job of sharing why other content is pertinent. “[M]uch of the school curriculum . . . does have potential value, but we have lost sight of the reasons for including it. We need to rediscover and articulate the life-application bases for retaining this content and teach it accordingly”(p. 137).

Kaplan (2006) proposed that educators can make learning meaningful by helping students develop an appreciation of learning. Accordingly, students can develop a personal value for learning by reflecting on how their lives will be different by learning, or not learning, given school content.

Students’ perceptions of their environment play an important role in their achievement motivation. Students must expect to succeed and know that those around them will support their efforts. They must trust that their efforts will not be thwarted by external factors and that putting forth effort is not a waste of time and energy. Students who view their environment as friendly and reinforcing may be more likely to demonstrate motivated behavior. Phrases such as, “My teachers does not like me” or “I cannot learn the way he teaches” may be signs that students do not view their environment as friendly or that they have developed a belief that their efforts do not affect outcomes (Rathvon, 1996).

Some environmental factors are within an individual’s control, others are not. Ogbu (1978) noted that people put their effort into areas where they believe they can be successful and in environments where they believe they are supported. Worrell (2007) noted that the relationship between ethnic identity exploration/affirmation and academic achievement was moderated by the environment for African American students. Thus, perceptions of the environment factor significantly in achievement motivation.

Although each of the three attitudes discussed above is important, it is their interaction that results in engagement and performance. Motivated students feel good about their abilities, find the tasks in which they are engaged meaningful, and feel supported and appreciated in their environment. When these three areas are measured, the lowest scoring one of them often is the single best predictor of achievement and satisfaction levels (McCoach, in press; Siegle & McCoach, 2009). In other words, those who are motivated and achieve tend to believe they have the skills to do well (self-efficacy), tend to find the work meaningful (goal valuation), and tend to view their environment as supportive (environmental perceptions).

The intensity of the attitudes in the three areas need not be the equally strong; however, attitudes must be positive in each area. Ultimately, the three attitudes direct a resultant behavior (self-regulation) that results in achievement. According to this model, if any one of the three components is low, regardless of the strength of the others, motivation is hindered.

#### **Summary and Conclusion:**

Although much of the research on underachievement has focused on

characteristics of underachievers, the most important unresolved issue is how to reverse the underachievement of gifted students. Most interventions designed to reverse underachievement fall into two general categories: counseling and instructional interventions (Butler-Por, 1993; Dowdall & Colangelo, 1982). Unfortunately, there is no magic solution to the problem of underachievement and a combination of counseling and instructional interventions appears to currently be the most promising option. The best-known interventions involve part-time or full-time special classrooms (e.g., Supplee, 1990; Whitmore, 1980). These interventions usually involve smaller student/teacher ratios, student choice, and less conventional teaching and learning activities. Baum, Renzulli, and Hebert (1995b) and Emerick (1992) demonstrated that using students' strengths and interests can reverse the underachieving cycle.

No one type of intervention appears to be effective for the full range of underachieving gifted students. Because the factors influencing the development and manifestation of underachievement vary, a continuum of strategies and services may be necessary if we are to systematically address this problem. Different types of underachievers may require different combinations of counseling and instructional or curricular modifications. Successful interventions should incorporate both proactive and preventative counseling and innovative instructional interventions. Future researchers in this field should posit coherent, complete models of gifted underachievement and design interventions in accordance with their proposed models.

First, researchers should begin to explore the relationship between classroom practices and academic underachievement. Research exploring the impact of differentiation, acceleration, enrichment, and other curricular modifications on patterns of achievement and underachievement could provide important information for educators. Reis (1998) observed a relationship between unchallenging or inappropriate curriculum in elementary school and underachievement in middle or high school. If unchallenging scholastic environments produce underachieving gifted students, then providing intellectual challenge and stimulation at all grade levels should decrease underachievement. VanTassel-Baska's curriculum development work at The College of William and Mary is a good example of creating intellectually challenging curriculum in a variety of content areas (VanTassel-Baska & Stambaugh, 2007b). Whether using the William and Mary curriculum with underachievers can help to reverse their underachievement behaviors would be an interesting line of future inquiry.

Second, the long-term effects of interventions aimed at reversing underachievement behaviors remain underexplored. Do underachievement interventions have enduring effects on student motivation and achievement? What happens when the student is once again faced with nonstimulating schoolwork? Are there critical periods in which the interventions appear to

sustain more positive long-term effects? These and many other questions remain unanswered.

Third, research should examine the effectiveness of family oriented interventions, such as family counseling and home and school partnerships. The Focusing on the Future event designed by VanTassel-Baska at The College of William and Mary exposes high-ability learners to career opportunities related to the arts, humanities, mathematics, and sciences; and informs parents of considerations and guidelines for effective career and academic planning. Events such as this can encourage and promote long-term goal setting and subsequent academic achievement.

Finally, special attention needs to be paid to the underachievement of underrepresented groups. In 2006, VanTassel-Baska, with assistance of the Jack Kent

Cooke Foundation and the National Association for Gifted Children, organized a conference on low-income promising learners. The proceedings of that conference resulted in the publication of *Overlooked Gems: A National Perspective on Low-Income Promising Learners*, which contained priorities for action in this area (VanTassel-Baska & Stambaugh, 2007a). This conference and the subsequent publication provide an agenda for promoting talent development among underserved groups.

As stated earlier, no single intervention will work with all gifted underachievers.

Just as gifted achievers differ from gifted underachievers, gifted underachievers differ from each other. Researchers and practitioners need to discover how the factors discussed in this chapter interact with each other and the extent to which they impact the achievement of gifted students. Motivation research has only begun to explore the role giftedness plays on achievement motivation. We look forward to the work future researchers will conduct in this arena.

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## **A Study of Parental Perception of Corporal Punishment and Child Physical Abuse**

\* Feroz Ahmad

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***Abstract-** The present study seems justified interims of corporal punishment and child physical abuse in Indian context the main objective of study is to determine parent's perception of reasonable physical punishment, impact of corporal punishment on children's adjustments, self concept and their personality. Two hypotheses were formulated for empirical verification in terms of corporal punishment and child physical abuse. Sample of 200 subjects will draw from the different schools of Chapra District. Result shows the physical punished children were more introvert and have low self concept than their counterparts.*

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**Key Words-** corporal punishment, adjustment, self concept, personality

**Introduction:** Corporal Punishment is the use of physical force with the intention of causing a child to experience physical pain, but not injury, for the purpose of correction or control of the child's behavior (Gershoff, 2002). Discipline is an unavoidable aspect of parenting. Parents often have questions concerning the limits when using corporal punishment regarding appropriate age, frequency, and severity (Saadeh, Rizzo, & Roberts, 2002). These questions are often left unanswered, due to the fact that it is challenging to study and measure the pain and intensity that may result to the child from corporal punishment. Many parents are interested in gaining more information on appropriate discipline methods, yet even the medical system has failed in this regard. One study reports that 75 % of clinicians failed to discuss discipline approaches with parenting patients, yet 45% of these parents desired information (Schuster, Duan, Regulado, & Klein, 2000). This is largely due to the fact that even pediatricians do not know what leads parents to use various discipline tactics (Barkin, Scheindlin, Edward, Richardson, & Finch, 2007). Studies have found that parent's personal experience with physical punishment in childhood is one factor associated with the Parental Perception utilization of physical discipline with their own children; however, the use of discipline practices and physical punishment are shaped by many influences including race, ethnicity, and social class (Horn, 2004; Kelley, 1992; Magnuson & Waldfogel, 2005). Although much of the research regarding influences on child disciplinary tactics has focused on characteristics of the child or the

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\* AssistantTeacher, Department of Psychology, Islamia Inter college, Olhan pur, Chapra



parent, the laws involving corporal punishment and parents' awareness of such laws are also relevant.

Since the boundaries of corporal punishment are difficult to measure for professionals and parents alike, one serious risk factor of corporal punishment is the possibility of escalation to physical abuse.

One study investigating the risk of corporal punishment for physical abuse found that parents who physically abused their children reported two thirds of their abusive incidents began as an attempt to change the child's behavior (Strauss & Stewart, 1999).

#### **Objective of the study:**

The present study seems justified interims of corporal punishment and child physical abuse in Indian context the main objective of study is to determine parent's perception of reasonable physical punishment, impact of corporal punishment on children's adjustments, self concept and their personality.

Keeping in this view the influence of child physical abuse and corporal punishment was considered worth by to investigate factors associated with self concept and personality.

#### **Hypothesis:**

Following hypotheses were formulated for empirical verification in terms of corporal punishment and child physical abuse.

1. The respondent of physical abused group would show low self concept than their respondent of corporal punish group.
2. The respondent of physical abused group would show high score on introversion than the respondent of corporal punish group.

#### **Methodology:**

##### **Smple:**

Sample of 200 subjects will draw from the different schools of Chapra District.

##### **Tools:-**

1. Self concept inventory by S.M. Mohsin
2. Eysenck's personality inventory
3. Personal data sheet
4. Corporal punishment and child abuse questionnaire

##### **Result :**

The table 1 shows that physical abused children have significantly highest score on the Mohsin's self concept inventory than the corporal punished children.

**Table.1**

Scale	Group	N	M	SD	t	P
Self concept scale	Physical abused	100	15.34	07.34	7.97	(P<.01)
	Corporal punished	100	24.67	09.37		

**Table.2**

Scale	Group	N	M	SD	t	P
EPI (introversion)	Physical punished	100	13.49	5.14	6.86	(P<.01)
	Corporal punished	100	9.37	3.42		

The table 2 shows that physical punished children have significantly higher score on the introversion dimension.

#### **Discussion & conclusion:**

The forgoing result shows the physical punished children were more introvert and have low self concept than their counterparts. Some earlier studies have also reported similar results. Result may be interpreted in terms of suppression, social rejection and feeling helplessness.

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## **A Study of Personality Type and Self Concept on Emotional Intelligence**

\* Namita Kishore

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***Abstract-** This study was conducted on a sample of 200 officials drawn equally from private and public sector of chapra district with a view to examine the effect of self concept and type A-B personality on emotional intelligence. Self concept inventory, Emotional intelligence and Type A-B personality inventory were administered. The result indicated that high self concept respondents show high score on emotional intelligence. The type A-B personality shows high score than their counterpart in respect of emotional intelligence.*

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**Key Words-** Emotional intelligence, A-B personality, self concept

**Introduction:** Emotional intelligence can be assessed most directly by asking a person to solve emotional problems, such as identifying the emotion in a story or painting, and then evaluating the person's answer against criteria of accuracy (Mayer, DiPaolo, & Salovey, 1990; Mayer & Geher, 1996). Emotional intelligence has often been conceptualized (particularly in popular literature) as involving much more than ability at perceiving, assimilating, understanding, and managing emotions. These alternative conceptions include not only emotion and intelligence per se, but also motivation, non-ability dispositions and traits, and global personal and social functioning (e.g., Bar-On, 1997 Goleman, 1995). Bar-On Emotional Quotient Inventory (EQ) includes 15 self-report scales that measure a person's self-regard, independence, problem solving, reality-testing, and other attributes (Bar-On, 1997). Such qualities as problem solving and reality testing seem more closely related to ego strength or social competence than to emotional intelligence.

Emotions are internal events that coordinate many psychological subsystems including physiological responses, cognitions, and conscious awareness. Emotions typically arise in response to a person's changing relationships, when a person's relationship to a memory, to his family, or to all of humanity changes, that person's emotions will change as well. Emotional intelligence refers to an ability to recognize the meanings of emotions and their relationships and to reason and problem-solve on the basis of them. Emotional intelligence is involved in the capacity to perceive emotions, assimilate emotion-related feelings, understand the information of those

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\* J.P. University, Chapra

emotions, and manage them (Mayer & Salovey, 1997; Salovey & Mayer, 1990).

Self-concept is important, of course, because people often act on their beliefs about their abilities as opposed to their actual abilities (Bandura, 1977). Emotional intelligence represents an alternative grouping of tasks to social intelligence. On one hand, emotional intelligence is broader than social intelligence, including not only reasoning about the emotions in social relationships, but also reasoning about internal emotions that are important for personal (as opposed to social) growth. On the other hand, emotional intelligence is more focused than social intelligence in that it pertains primarily to the emotional (but not necessarily verbal) problems embedded in personal and social problems. Research on social intelligence has continued, with important work by Sternberg and Smith (1985), Cantor and Kihlstrom (1987) Legree (1995) and others. Much of that work represented important conceptual development of social intelligence; little of that work, however, concerned itself with actual ability measurement in relation to other intelligences (some exceptions are Legree, 1995; Wagner & Sternberg, 1985). In addition, other intelligences have been proposed, e.g., the multiple intelligences of Gardner (1993) which included personal, musical, and other intelligences. Here, too, research on individual differences and their relations to already-existing intelligences was de-emphasized (Sternberg, 1994).

**Objectives:**

In the present study, emotional intelligence is major component which was treated as dependent variable and independent variable are type A-B personality and self concept. This dependent variable is correct issue for researcher. The objective of the present study is to compare between type A-B personality and self concept in respect of emotional intelligence.

**Hypothesis:** Following hypotheses are formulated in respect of previous show and review.

1. The respondent of Type A personality would show high emotional intelligence than their counterparts.
2. The subject of high self concept would show high emotional intelligence than their counterparts.

**Methodology:**

**Sample:** An incidental sample of 200 subject will drawn from the population of different officials of Chapra district.

**Tools:**

- (i) Emotional intelligence scale/inventory by K.D.Brota
- (ii) Self concept inventory by S.M. Mohsin
- (iii) Type A-B personality scale by Hunger (1982)

**Result and Discussion:** Comparison of type A personality and type B personality in respect of their emotional intelligence level has been presented

in table no.1.

#### Comparison of type A-B personality regarding EQ

Variable	N	M	SD	SE	t	df	P
Type A	100	67.52	7.36	.73	11.45	198	<.01
Type B	100	56.87	6.12	.61			

It is evident from table no 1 that type A has scored higher than their counterpart on EQ. The difference between the two groups is significant. ( $t=11.45$   $df$  198  $p<0.1$ ). The finding is not in the hypothesized direction. The first hypothesis was not confirmed. The overall analysis of the data leads us to conclude that people who are habitually hurried, competitive and hostile will tend to be unsocial. Emotional intelligence represents an alternative grouping of task to social intelligence.

**Self Concept & Emotional Intelligence:** Compare of high self concept and low self concept group in respect of their emotional intelligence level have been presented in table no 2

Variable	N	M	SD	SE	t	df	P
High self concept	100	72.47	7.78	.77	12.99	198	<.01
Low self concept	100	59.22	6.86	.68			

It is evident from table no 2 that emotional intelligence is found higher in high self concept group. It is clear the high self concept group show superiority on low self concept group in respect of emotional intelligence. The difference the two group is significant ( $t=12.99$   $df$  198  $p= 0.1$ ). The finding is in the hypothetical direction. This hypothesis is retained.

**Conclusion:** It can be concluded on the basis of the study that type B personality and high self concept group found superior than that of their counterparts in respect of emotional intelligence.

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## **A study of parental involvement on student's achievements and adjustment**

\* Sunil Kumar Singh

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***Abstract-** In this study 200 samples collected from Chapra district. Two hypotheses from in respect of Parental Involvement, achievement & adjustment of the pupil for the collection of the data Parental Involvement scales, achievement scale & adjustment inventory were administrated. Findings show that the both hypotheses were confirmed.*

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### **Key Words- Parental Involvement, Achievement, Adjustment**

**Introduction:** The extent and form of parental involvement is strongly influenced by family social class, maternal level of education, material deprivation, maternal psycho-social health and single parent status and, to a lesser degree, by family ethnicity. The extent of parental involvement diminishes as the child gets older and is strongly influenced at all ages by the child characteristically taking a very active mediating role. Parental involvement takes many forms including good parenting in the home, including the provision of a secure and stable environment, intellectual stimulation, parent-child discussion, good models of constructive social and educational values and high aspirations relating to personal fulfillment and good citizenship; contact with schools to share information; participation in school events; participation in the work of the school; and participation in school governance.

The impact of parental involvement are introduced and examined. Parental involvement is a catch-all term for many different activities including 'at home' good parenting, helping with homework, talking to teachers, attending school functions, through to taking part in school governance.

Parental involvement is strongly positively influenced by the child's level of attainment: the higher the level of attainment, the more parents get involved. The most important finding from the point of view of this review is that parental involvement in the form of 'at-home good parenting' has a significant positive effect on children's achievement and adjustment even after all other factors shaping attainment have been taken out of the equation. In the primary age range the impact caused by different levels of parental involvement is much bigger than differences associated with variations in the quality of schools. The scale of the impact is evident across all social classes and all ethnic groups.

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\* Jai Prakash University, Chapra

Other forms of parental involvement do not appear to contribute to the scale of the impact of 'at-home' parenting. Differences between parents in their level of involvement are associated with social class, poverty, health, and also with parental perception of their role and their levels of confidence in fulfilling it. Some parents are put off by feeling put down by schools and teachers. Research affords a clear model of how parental involvement works. This model is described in the report. In essence parenting has its influence indirectly through shaping the child's self concept as a learner and through setting high aspirations.

Research on interventions to promote parental involvement reveals a large number of approaches ranging from parent training programmes, through initiatives to enhance home school links and on to programmed of family and community education. It is widely recognized that if pupils are to maximize their potential from schooling they will need the full support of their parents. Attempts to enhance parental involvement in education occupy governments, administrators, educators and parents' organizations across North America, Australasia, continental Europe, Scandinavia and the UK. It is anticipated that parents should play a role not only in the promotion of their own children's achievements but more broadly in school improvement and the democratization of school governance. The European Commission, for example, holds that the degree of parental participation is a significant indicator of the quality of schooling. Sacker et al (2002) set out to examine how inequalities in educational achievement and adjustment come about. It has been well known for decades that pupils' educational achievement is related to parents' social class yet the mechanisms that form this relationship are not well understood. The effect of parental involvement (in terms of providing a home learning environment) on achievement and cognitive development has been explored in recent studies of English preschoolers (Sylva, et al, 1999; Melhuish et al, 2001).

Melhuish et al (2001) concluded that, 'higher home learning environment was associated with increased levels of cooperation and conformity, peer sociability and confidence, ... lower anti-social and worried or upset behaviour and higher cognitive development scores.

**Objectives:** This study has been designed to examine the effect of these three independent variables namely parental involvement on the achievement. It is universally acknowledged that parental involvement and support is an important attribute of human personality and it accounts for a lot of good as well as evil consequences for developing children.

**Hypothesis:** Following hypotheses were formulated in terms of parental involvement, support and education.

1. Parental involvement would be positively and significantly correlated to student's achievement.
2. Parental involvement would be positively and significantly correlated

to student's adjustment.

**Methodology:** Sample of 200 subjects will be draw from the different high schools of chapra district.

**Tools:** Following tools and inventory will be used for measurement.

1. Personal data sheet developed by researcher.
2. Adjustment inventory by Mohsin and Shamshad.
3. Achievement inventory by Mukharjee
4. Parent child relation scale by Akhter

**Results and Interpretations:**

To ascertain the influence of parental involvement on achievement and adjustment pearson r has been calculated and presented in table 1.

The table shows that the influence of parental involvement on achievement has been significant. The pearson r is significant at 0.01 level.

Table No.1

Variable	No	R	df	P
Parental involvement/achievement(Mother)	200	.68	198	<.01
Parental involvement/achievement (Father)	200	.58	198	<.01

The table 2 shows that the influence of parental involvement on adjustment has been significant. The pearson r is significant at 0.05 level.

Table No.2

Variable	No	R	df	P
Parental involvement/Adjustment(Mother)	200	.47	198	<.05
Parental involvement/Adjustment(Father)	200	.28	198	<.05

**Conclusion:** In identifying the main conclusions from this research review it is necessary for a number of reasons to distinguish between research on spontaneously occurring parental involvement in their children's education and research on attempts to intervene to enhance such involvement. Spontaneous activity and induced activity are very different phenomena. Parental involvement is highly correlated to achievement pupil. Parental involvement is positively insignificantly correlated to achievement pupil.

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## Physiochemical Parameters of River Daha, Siwan (Bihar)

\* Kumari Shilpi

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**Abstract-** *The physiochemical factors of Daha River that were studied from Jan 2012 to Dec 2013 are Temperature, pH, Turbidity, Conductivity, Total Dissolved Solids, DO, BOD, COD, Total Hardness, Ca<sup>++</sup>, Mg<sup>++</sup>, PO<sub>4</sub>-2 and NO<sub>3</sub>- and Cl<sup>-</sup>. The samples were collected and analyzed every month for consecutive two years to study the effect of pollution and pollutants on water of this river that revealed seasonal and site specific trends in respect of each parameter. The result of this study has revealed that water near the source remained acceptable while at other places away from source remained slightly to moderately polluted.*

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**Key Words-** Physiochemical Parameters, Temperature, Turbidity, Conductivity, Dissolved Solids

**Introduction:** Water is quintessential for survival of all living beings and is equally vital for all segments of economic activities undertaken by man. However the availability of clean water is becoming scarce day by day due to pollution caused by domestic, commercial, industrial and agricultural activities. Today many inland lakes in America and Russia have become so polluted that they are unable to support any aquatic life. In our country to the holy rivers like Ganga, Yamuna have been reduced to mere drains in some places on account of carrying heavy sewage and industrial wastes. The fate of River Daha flowing through Siwan district in North Bihar is not different from these.

River Daha is the lifeline of people of Siwan and is the only river crossing through this district of North Bihar. It supports the people of the district by providing water for agriculture, drinking, industry, ablutions besides recharging the groundwater. However it remains highly neglected and now the signs of pollution have visibly shaken the environmentalists and academicians alike though proper exhaustive work related to its pollution load and threatened aquatic fauna is still lacking.

**Study Area:** For convenience and thorough study three sites as detailed below on River Daha have been selected viz:

**Site I:** Located at Tarwa (Siwan District, Bihar) on the upstream of the river. This site is situated away from the town and less polluted and covers a vast

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\* Chitragupta Nagar, PO- Siwan, Dist- Siwan, Pin- 841226, Bihar

area. This site is free from anthropogenic activity.

**Site II:** It is comparatively polluted site because it receives city sewage from the town. This site is surrounded by population and cultivated fields and are affected by anthropogenic activity.

**Site III:** This site is located downstream on the river far away from town and is free from anthropogenic activity. From outside activity it looks comparatively clean.

**Climate:** The climate of this district can be studied from the types of seasons that are enjoyed by the people of this district that also affects the water status of Daha River. The seasons being:

- (i) Cold weather season (November to Mid March)
- (ii) Hot weather season (Mid March to Mid June)
- (iii) Rainy season (Mid June to October)

The seasonal classification of the climate has an important bearing on the water quality of Daha River which gets flooded during rainy season and shrinks during midsummer.

#### **Sampling of Water Sample:**

The representative sample of water from the fixed sampling sites of river was collected in properly cleansed and thrice rinsed polyethylene container of 2.5 lit capacity. Some of the physiochemical parameters such as temperature of the water, pH, DO, TDS and conductivity values were estimated on the spot. The rest of the pollution indicating chemical parameters such as BOD, COD, Total Hardness,  $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$ ,  $\text{PO}_4^-$  and  $\text{NO}_3^-$  and  $\text{Cl}^-$  were measured within 48 hrs. from the period of sampling.

**Analysis of Water:** The analysis of nutrients such as  $\text{SO}_4^-$ ,  $\text{PO}_4^-$ ,  $\text{K}_2\text{O}_3$  and nitrogen was also done. All the above parameters were estimated as per standards methods (APHA, 1975).

#### **Result & Discussion:**

**1. Temperature:** The chemical and biological characteristics of organisms living in water are affected by the temperature of water. Generally a rise in temperature of water speeds up chemical reactions, reduces solubility of gases and alters taste and odour of water. At higher temperature with less dissolved gases the water becomes tasteless and even does not quench thirst. At elevated temperature metabolic activities of animals increase requiring more oxygen but at the same time solubility of  $\text{O}_2$  decreases. The disease resistance in fishes also decreases with rise in temperature.

During the period of investigation the value of temperature ranged between 14 and 33 degree centigrade. It was maximum in the month of June at site 3 and minimum in January at site 1. Temperature at site 1 ranged between 14 and 29 degree centigrade with an average of 21.9 whereas temperature at site 2 ranged between 14.2 and 30.3 degree centigrade with an average of 23.94 degree centigrade in the 1<sup>st</sup> year of investigation (Table1). Variation of temperature in the 2<sup>nd</sup> year of investigation (table 2) ranged

between 14 degree centigrade and 32 degree centigrade with an average of 25.058. Temperature at site 1 ranged between 14 and 29 degree centigrade with an average of 23.3 degree centigrade, at site 2 between 14 and 32 degree centigrade with an average of 25.825 degree centigrade whereas at site 3 it ranged between 15 degree centigrade and 39 degree centigrade with an average of 26.0583. Variation in temperature between 14 and 39 degree centigrade is suitable for growth of plant and aquatic fauna like fish.

Overall temperature was found to be high in May and June that decreases in July followed by rise in August and September with a gradual fall from October to January and a gradual rise from February onwards. The month of July experienced usual monsoon and thus the water temperature remained low at all the sites. A decrease in water temperature with rains has also been observed by Kant and Anand (1978) and Begde and Verma (1985).

Klein (1956), Jolly and Chapman (1966) and Enkateshwarlu and Jayanti (1968) also noted that stream after receiving industrial effluents become comparatively warmer. Munawar (1970) explained that chemicals when discharged into water react with each other in aqueous medium as well as with chemicals already present in water thereby generating heat and bringing about an increase in water temperature.

**2. pH:** pH of a solution at a given temperature refers to its hydrogen ion activity that measures the acidity and alkalinity of water. It is expressed as a negative reciprocal of hydrogen ion activity in moles per liter (APHA 1989).

The pH recorded at all sites during the period of investigation from January 2012 to December 2013 are given in Tables 1 and 2.

During the 1<sup>st</sup> year the pH values at Site I ranged between 7.5 and 8.1 with an average of 7.75, at Site II between 7.7 and 8.3 with an average of 7.808 and at Site III between 7.6 and 8.2 with an average of 7.9. Minimum value of pH recorded was 7.5 and maximum at 8.3. During the 2<sup>nd</sup> year of investigation pH value ranged from 7.0 to 8.8 with an average 7.735. At Site I pH ranged from 6.8 to 8.7 with an average of 7.53, at Site II from 6.8 to 8.7 with an average of 7.65 and at Site III from 7.0 to 8.0 with an average 7.55. pH was maximum in the month of May and minimum in November. During the period of investigation pH was minimum at Site-I, maximum at Site-II and again lower at Site-III. Maximum alkaline nature of water was reported at pH 8.3. Most natural water is generally alkaline.

pH value was recorded to be lower at Site I compared to other sites remaining mostly between 7 and 8.7 suggesting that water here is free from pollution. Similar range of pH values in uncontaminated water has been reported by Ellis (1937), Banerjee (1957), Agrawal (1960) and Patra and Nayak (1983).

pH value was recorded to be high at Site II, that is 8.3, that might be due to addition of effluents discharged from industries as well as by addition of sewage. Kumar and Sharma (1979) and Singh et al (1983) also observed

high pH values at the site where sewage and industrial effluents were discharged. Similar range of high pH value in contaminated water has been reported by Agrawal (1960) and Patra and Nayak (1983).

pH value was found to be low during rainy season from July to August due to inflow of rain water. Similar was observed by Bagde and Verma (1985), Sharma(1990) and Parveteesam et al (1991).

**3. Turbidity:** Turbidity of water is largely caused by suspended silt, clay, plants and planktonic organisms that may be caused temporarily by rain and floods. It affects the river productivity and its fishes. Turbidity showed high in the month of monsoon when river gets flooded and declined when water level goes down. During the period of investigation the value of turbidity was recorded as shown in Tables 1 and 2. The fluctuation in turbidity is considered to be from 10 to 68 NTU.

Tables 1 and 2 show the value of turbidity from January 2012 to December 2013.

Turbidity of river Daha during the 1<sup>st</sup> year of investigation (table 1) ranged between 10 to 68 NTU. Maximum value was recorded during monsoon and minimum in January (table 1). At Site 1 turbidity ranges from 10 to 45 NTU with an average of 23.4 NTU, at Site 2 from 18 to 65 NTU with an average of 44 and at Site 3 from 15 to 68 NTU with an average of 44.75. The annual average for the first year of investigation was 37.38 NTU. During the 2<sup>nd</sup> year of investigation (table2) turbidity ranges from 10 to 68 NTU with an average of 40.02 NTU (Table2). At site 1 turbidity ranges from 10 to 45 NTU with an average 22.5 NTU, at site 2 it ranged from 18 to 65 NTU with an average of 46.16 NTU whereas at site 3 it ranged from 36 to 68 NTU with an average of 51.41 NTU.

During the period of investigation the value of turbidity is high in monsoon at all sites whereas it decreases in winter and pre monsoon. Similar observations have been made by Wallen (1951), Nikol's Sky (1963) and Trivedy and Goel (1986).

**4. Conductivity :** Conductivity gives an idea of the total solids contents of water. Firstly higher the mineral content of water higher will be its conductivity. Consequently the electrical current can flow more freely through water. Secondly higher conductivity decreases the activity co-efficient which increases the solubility of CaCO<sub>3</sub> and other materials. Ber (1958), Radwan(1976) and Ellis (Opcit); Trivedi and Goel (1986) Kataria and Jain(1995) studied the conductivity of water.

The value of conductivity during the period of investigation ranges from 200 to 399 us/cm in the 1<sup>st</sup> year of investigation (table 1). At Site 1 its value was 200-389 us/cm with an average of 316.33 us/cm, at Site 2 it was 215 to 386 us/cm with an average of 316.8 us/cm and at Site 3 it was 210-399 us/cm with an average of 320.3 us/cm. The annual average was 320.9us/cm. In the 2<sup>nd</sup> year of investigation value of conductivity ranges from 230-398 us/cm

with an average of 336.3 us/cm (table 2). At site 1 it ranges from 230 to 359 us/cm with an average of 312.5 us/cm, at site 2 it ranges from 280-385 us/cm with an average of 364.5 us/cm and at site 3 it ranges from 230-389 us/cm with an average of 332us/cm.

Tables 1 and 2 shows conductivity of water studied from January 2012 to December 2013. Conductivity of river water decreases during monsoon due to dilution of water but increases during winter and summer due to low water level. The same was reported by Berg (1985) and Radwan (1976). Ellis (Opcit) stated that the specific electrical conductance for supporting fish life is between 200 and 399. The variation in electrical conductivity could be attributed to natural concentration of ions present in water. Conductivity of River Daha is fish life supporting.

#### **5. Total Dissolved Solids:**

Total dissolved solids also referred to as dissolved solids denote mainly various kinds of minerals present in water though some organic substances as often present in polluted water may contribute to dissolved solids. Dissolved solids do not contain any gas and colloids and are composed of mainly carbonates and bicarbonates, chlorides, sulphates, nitrates, etc. TDS indicate the general salinity of water. TDS may be the combined effect of lithologic variation, industrial effluents and chemical fertilizer contamination [Mahapatra et al (2001)]. Water containing more than 500mg/l TDS is not considered for drinking.

Tables 1 and 2 show the value of TDS from January 2012 to December 2013.

During the period of investigation the value of TDS ranges from 142 to 300mg/l (Table 1 and 2) with an average of 209.39 mg/l. TDS at Site 1 ranged from 142 to 238 mg/ml with an average of 193.58 mg/l, at Site 2 from 189-300 mg/l with an average of 221.5 mg/l and at Site 3 from 178-245 mg/l with an average of 221.5 mg/ml. During the 2<sup>nd</sup> year of investigation TDS of water ranged from 152mg/l to 239 mg/l (table 2). At Site 1 value of TDS ranged from 152mg/l to 239/mg/l with an average of 198.9mg/l, at Site 2 from 185mg/l to 280mg/l with an average of 229.9 mg/l and at Site 3 from 173-280 mg/l with an average of 231.3 mg/l.

The value of TDS increases in summer and winter and decreases in monsoon that were reported by Tripathi and Pandey, Hannan and Young (1974), Chandra et al (1901), Trivedy and Goel (1986) and Mahapatra et al (2001).

#### **6. Dissolved Oxygen :**

Dissolved Oxygen is one of the most essential factors in any aquatic system. Since most of the aquatic biota depends upon it the D.O level in nature and water depends on physical, chemical and biological activity prevailing in the water body (APHA 1989).

Tables 1 and 2 show variation in D.O. content during the period of

investigation from January 2012 to December 2013.

During the 1<sup>st</sup> year of investigation DO was found to be vary from 5.0 to 8.2 mg/l with an average of 6.61 mg/l (table 1). At Site 1 the value of DO ranged from 5.3 to 8.2 mg/l with an average of 6.81 mg/l, at Site 2 from 5.2 to 7.8 mg/l with an average of 6.48 mg/l and at site 3 from 5.0 to 7.9mg/l with an average of 6.56 mg/l. During the 2<sup>nd</sup> year of investigation DO was found to vary from 5.6 to 8.2mg/l with an average of 7.01 mg/l (table 1). At site 1 the value of DO ranged from 6.3 to 8.2 mg/l with an average of 7.3mg/l, at Site 2 from 5.7 to 7.9 mg/l with an average of 6.75 mg/l and at Site 3 from 5.6 to 7.9 mg/l with an average of 6.8mg/l. Its value was maximum during winter and minimum during summer (table 1 and 2). During the period of monsoon DO decreases due to dilution of water. The range of DO is suitable for the growth of aquatic fauna.

Bunnet (1971) and ICMR (Report No. 440) has prescribed minimum permissible limit of DO in water to be 15 ml per litre whereas CBCWP (1982) prescribed this limit as 6 ml/L. The present investigation shows DO level in water of River Daha remaining above minimum permissible limit as prescribed by these two groups. The DO of this river lies in the permissible limit for survival of fish and aquatic fauna. But sometimes as reported in November 2013 DO level fell down to 2mg/l (at Site II) thereby resulting there in high fish mortality. Same observation was reported by David and Ray (1966), Verma and Shukla (1969), Brookes et al (1977), Vasisht and Kapoor (1981), Konar et al (1991) and Maaruti and Subba (2000).

**7. BOD :** Biological Oxygen Demand shows the amount of molecular oxygen required by micro-organisms to stabilize the biodegradable organic matter present in the aquatic system and may be defined as the amount of oxygen required by micro-organisms present in a sample to oxidize the organic matter and converting it into stable inorganic form [Chapman and Kimstach (1992)]. BOD was found to be an approximate measure of bio-chemically degradable organic matter present in water by Liebman (1962), David and Ray (1966), Jolly and Ciaccio (1971), Patra and Nayak (1983), Sinha and Prasad (1985), Sharma et al (1989), Gautam (1991), Tripathi et al (1991), Chapman and Kimstach (1992) and Khatwar and Trivedy (1992).

Table I and II shows monthly variation of BOD in water during the period of investigation from January 2012 to December 2013. During the period of investigation BOD ranges from 1.8 to 2.5 mg/l with an average of 2.41mg/l in the first year of investigation (Table 1) and from 1.8 to 3.3 mg/l with an average of 2.56 mg/l in the second year of investigation (Table 2). During first year of investigation at Site I, BOD ranges from 1.8 to 2.5 mg/l with an average of 2.49mg/l, at Site II BOD ranges from 2.0 to 3.0 mg/l with an average of 2.375 mg/l and at site Site III from 1.8 to 3.0 mg/l with an average of 2.375 mg/l. Second year of investigation shows the value of BOD at Site I from 2.0 to 2.9 mg/l with an average of 2.5 mg/l, at Site II from 2.0

to 3.5 mg/l with an average of 2.6 mg/l and at Site III from 1.8 to 3.3 mg/l with an average of 2.6 mg/l.

Site I is free from pollution source showing low value of BOD. Klein (1956), Venkateshwarlu and Jayanti (1968), and Chapman and Kimstach (1992) also observed that the water free from contamination show low value of BOD.

Site II shows high value of BOD. This site receives waste water from sewage. In the Month of Dec-2012 the value of BOD was very high due to pollution caused by some effluents. Verma and Shukla (1969), Gautam (1991) and Jhingram (1991) also observed the same.

An inverse relationship was discovered between BOD level in water and its DO contents. An increase in BOD level in water depleted its DO. Similar relationship has been noted by David & Ray (1966), Saxena et al (1966), Venkatesh Waralu and Jayanti (1968), Ciaccio (1971), Verma et al (1978), Holland et al (1983), Adholia (1991 a) (1991 b), Tripathi et al (1991) and Meyeck et al (1992).

The BOD level found to increase during summer and decrease during winter. High value of BOD in summer may be attributed to high biological activity at high temperature whereas low BOD level during winter may be attributed to low biological activity at low temperature. Similar observation has been made by David & Ray (1966), Saxena et al (1966), Verma and Shukla (1979), Ciaccio (1971), Verma and Dalela (1975), Agrawal et al (1979), Rai (1978), Verma et al (1978), Sharma et al (1989), Ahmad and Siddiqui (1991), Tripathi et al (1991) and Sayal (1977).

The impact of rain on BOD level was also observed. The BOD level decreases after rain. The decrease in BOD level might be due to dilution of organic matter present in water. Ciaccio (1971), Verma et al (1978), Sharma et al (1989) and Tripathi et al (1991) also observed the same.

Klein (1956) Venkateshwarlu and Jayanti (1968) and Chapman and Kimstach (1992) observed that the BOD level above 2 mg/l in water indicated pollution. On the other hand CBCWP (1982) IS: (2296) (1982) and Abel (1989) suggested that good quality of water should not have BOD value greater than 3 mg/l. However ICMR (Report No. 44) have recommended the maximum permissible limit for BOD level in water as 5 mg/l. During the present investigation the entire site except site II in month of November shows permissible limit of BOD as recommended by Chapman and Kimstach (1992).

**8. COD:** The Chemical Oxygen Demand measures the total oxygen required for oxidation of organic matters present in the waste water by a strong chemical oxidant to carbon dioxide and water. The COD usually refers to the laboratory dichromate oxidation procedure. The COD test gives no indication of whether or not the waste is degradable biologically nor does it indicate the rate at which biological oxidation would proceed and hence the rate at which oxygen would be required in a biological system. The

determination of COD value is of great importance where BOD value cannot be determined accurately due to the presence of toxins and other chemicals. The COD value is generally higher compared to that of BOD value for the same water and waste water samples.

During the present investigation nowhere COD value has found to be lower than BOD showing the absence of benzene, hydrocarbons and other oxidation resistance substances in the river as detailed in Tables 1 and 2 showing the value of COD from January 2012 to December 2013.

During the first year of investigation (Table I) Site I showed the variation of COD from 5.6 to 13.0 mg/l with an average of 7.28 mg/l, Site II from 5.5 to 13.0 mg/l with an average of 9.58 mg/l and Site III from 6.7 to 14.0 mg/l with an average of 9.058 mg/l. During the second year of investigation (Table II) Site I showed the variation of COD from 4.9 to 20.0 mg/l with an average of 9.93 mg/l, Site II from 5.0 to 1.80 mg/l with an average of 11.20 mg/l and Site III from 6.0 to 16.0 mg/l with an average of 11.01 mg/l. Site II was found to be polluted whereas Site I was free from pollution.

**Site I** - has low value of COD during the period of investigation due to pollution free nature of water. Trivedy and Goel (1986) and APHA (1989).

**Site II** - the value of COD increases at this site due to sewage and also sometimes effluents. In the month of March 2013 Site II has very high value of COD due to discharge of unknown chemical. Similar observation was studied by Ogunrombi and Onuoha (1982); Zaroni (1986); Trivedy and Goel (1986); Jameel (1998) and Rajakumar et al (2006).

**Site III** - has lower value of COD than the preceding site. This happened because the sewage which was added at the preceding site got diluted as they reached the site downstream to them. Same is observed by Trivedy and Goel (1986) and Rajakumar (2006).

COD value also decreases in monsoon due to rain and again increases in summer. Trivedy and Goel (1996), Ogunrombi and Onuoha (1982) opined that COD value was generally greater than BOD value especially when waste water contains a significant amount of biologically resistant organic matter. Zaroni (1986) also opinion that the low BOD to COD ratio suggested that the organic solids that are present are resistant to biochemical degradation.

The present findings confirm the view of the above scholars. The recommended standard value for fresh water of the river is 14.87 which indicate its slight pollution status. High BOD and COD are noticed along with high fish mortality interfering with respiratory metabolism. Venkataraman (1996) observed similar high fish mortality in the month of November 2013.

**9. Total Hardness :** Hardness is the property of water which prevents its lather formation with soap and increases the boiling point of water. Principal cations imparting hardness are calcium and magnesium. However other cations such as strontium, iron and manganese also contribute to hardness. The anions responsible for hardness are mainly bicarbonate, carbonate, sulphate, chloride,



nitrate, silicate etc. Hardness is temporary due to presence of soluble  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  bicarbonate whereas permanent due to presence of  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  carbonate and salts of inorganic acid. Total hardness of water is due to  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  salts present in water besides carbonates, chlorides and sulphates. On the basis of physiochemical studies of water it was found that relative amount of Carbonic acid, Bicarbonates and Sulphates present in water are responsible for its total hardness. Hardness has no known adverse effects on health however some evidence has been given to indicate its role in heart disease. Hard water is also not suitable for domestic use in washing, cleaning and laundering purposes. Hardness of water may be advantageous in certain conditions like it prevents corrosion of pipes by forming a thin layer of scale and reduces the entry of heavy metals from pipes into water.

Tables 1 and 2 shows the monthly variation of total hardness recorded during investigation from January 2012 to December 2013.

During the first year of investigation (Table 1) the value of hardness ranged between 110-197 mg/l. At Site I total hardness ranged from 110-184 mg/l with an average of 143 mg/l, at Site II from 130-197 mg/l with an average of 172.25 mg/l and at Site III from 115-197 mg/l with an average of 167.83 mg/l. The value of total hardness was maximum at 229 mg/l in summer and minimum at 80 mg/l in monsoon. Similarly total hardness at Site II and Site III were 236 mg/l and 239 mg/l respectively during summer and 11 mg/l and 108 mg/l during rain due to dilution of river water.

During the second year of investigation (Table 2) total hardness ranged between 110 to 197 mg/l. Total hardness at Site I ranged from 110-194 mg/l with an average of 135.16 mg/l, at Site II from 130-197 mg/l with an average of 179.83 mg/l and at Site III from 115 to 192 mg/l with an average of 151.95 mg/l.

During the period of investigation total hardness was minimum at Site I and maximum at Site II. Total hardness was minimum during winter and monsoon and maximum in summer. Average value of TH in the first year was 161.027 mg/l and in the second year of investigation it was 199.75 mg/l.

**Site I:** Showed lower values of total hardness than other sites. This site was free from contamination and hardness mainly due to presence of carbonaceous salts. Sreenivasan (170 a), Patra and Nayak (1982), Chapman and Kimstach (1992) and Meybeck et al (1992) also viewed similarly.

**Site II:** Showed higher values of total hardness that might be due to discharge of sewage. Hays and Anthony (1985), Venkateshwarlu and Jayanti (1968), Munawar (1970 a), Kumar and Sharma (1979), Paramsivam and Sreenivasan (1981), and Tripathi et al (1991), also observed an increase in total hardness with addition of sewage into water.

**Site III:** The value of total hardness was found to be lower at this site than the preceding one that got diluted with distance. Hannan and Young (1974) observed decrease in hardness of water with distance.

Choudhary et al (1976), Chandra et al (1981), Parama Sivam and Sreenivasan (1981), Patra and Nayak (1982), Badrinath et al (1987), Bansal and Khare (1990) and Mishra (1991) recorded the highest total hardness in water wherein industrial effluents were discharged. Similar increase in total hardness with addition of sewage was observed by Hays and Anthony (1956), Oswals (1960), Venkateshwarlu and Jayanti (1968), Munawar (1970), Seenayya (1971), Trivedy and Goel (1986), Chapman and Kimstach (1992) and Maybeck (1992).

Hutchinson (1957), Wetzel (1975), Trivedy and Goel (1986), Chapman & Kimstach (1992) have given a very valuable inter-relationship between total hardness and pH value of water. The pH values were found to be in the range of 7.5-8.3 during present investigations. Hay and Anthony (1958), Venkateshwarlu and Jayanti (1968), Munawar (1970), Young et al (1972), Swarup and Singh (1979), Zutshi et al (1980), Yousuf et al (1984), Sinha and Prasad (1988) have reported that the hardness in surface water was mainly due to presence of bicarbonates.

Higher value of total hardness was observed during summer and lower during winter. Similar observation for seasonal variation have also been given by Hay and Anthony (1958), Venkateshwarlu and Jayanti (1968), Verma and Shukla (1968), Munawar (1970), Swarup and Singh (1979), Adnolla (1991), Kumar (1995), Jain et al (1996), Chakraborty et al (1959), Goldman and Wetzel (1963), Sreenivasan (1966), Swarup and Singh (1966), Adholia (1991), Kaur et al (1976), Sharkar and Joshi (2002) and Surve (2005). From these observations it can be interpreted that the increase or decrease in total hardness after rain depends upon the presence or absence of Carbonate and Sulphate ions in the soil of fields surrounding the river at the time of raining.

Das (2000) suggested that hardness ranging between 75 to 150 mg/l supports good fish yield. Productive water generally has hardness well above 20 mg/l. Sawyer (1960) classified water on the basis of hardness into the following three categories:

- (i) Soft water with hardness ranging from 0.00 mg/l to 75.00 mg/l
- (ii) Moderately hard water with hardness ranging from 76.00 mg/l to 150 m/l and
- (iii) Hard water with hardness ranging from 150-300 mg/l.

#### **10. Calcium:**

Calcium is one of the most abundant elements present in natural waters. It readily dissolves into water traversing the rocks rich in calcium minerals. The quantity of calcium in natural water generally varies from 10 to 100 mg/l depending upon the types of the rocks. Disposal of sewage and industrial wastes also add calcium to water. It has a high affinity to adsorb on soil particles and therefore the cation exchange equilibrium and presence of other cations greatly influences its concentration in water. Natural softening of water takes place where water percolates to aquifers due to exchange with  $\text{Na}^+$ .

Concentration of calcium is reduced at higher pH due to its precipitation as  $\text{CaCO}_3$ . Calcium as such has no hazardous effects on human health. In fact it is one of the most important nutrients required by organisms. Concentration up to 180 mg/l has found to be impairing physiological reactions in man (Lehr et al 1980).

Tables I and II shows monthly variations in calcium at all sites during the period of investigation from January 2012 to December 2013. During the first year of investigation (Table 1) the fluctuation of calcium ions in Daha River at Site I ranged from 45 to 87 mg/l with an average of 58.58 mg/l, at Site II from 50 to 98 mg/l with an average of 72.5 mg/l and at Site III from 45 to 95 mg/l with an average of 71.91 mg/l. During the second year of investigation (Table 2) the amount of calcium at Site I ranged from 55 mg/l to 75 mg/l with an average of 59.5 mg/l, at Site II from 55 to 98 mg/l with an average of 74.5 mg/l and at Site III from 55 to 95 mg/l with an average of 72.9 mg/l. Calcium level was maximum during summer and minimum during monsoon due to dilution of water.

**Site I:** Calcium contents were found to be lower than all other sites because this site is almost free from polluting elements. This has also been suggested by Thomson (1952), Bhuyan (1970), Zutshi et al (1980), Upadhyaya and Ray (1982), Trivedy and Goel (1986), Chapman and Kimstach (1992) and Meynack et al (1992).

**Site II:** Calcium contents were found to be high due to addition of sewage and sometimes effluents. Singh et al (1969), Bagde and Verma (1985), Trivedy and Goel (1986) and Sinha et al (1991) observed an increase in calcium contents due to addition of sewage.

**Site III:** Calcium contents were higher but lower than the previous sites. This happened because the sewage which was added at preceding sites got diluted as they reached this site. The dilution of Calcium salts with distance travelled by them has also been viewed by Mathuthu et al (1993).

The calcium contents varied differently with heavy and low rains. Heavy rains for longer duration caused dilution of water thereby decreasing its calcium contents that has also been reported by Boznaik and Kennedy (1968), Swarup and Singh (1979), Bagde and Verma (1985), Sinha and Prasad (1988), Khatavkar et al (1991), Mathuthu et al (1993) and Panday and Mukherjee (1993).

ICMR (Report No. 44) has prescribed maximum permissible limit of calcium in water to be 75 mg/l. The investigation of all sites selected for the present study revealed that River Daha has calcium ions well within the permissible limits. According to Ohle (1938) River Daha falls under category of water rich in calcium having Calcium >25 mg/l.

## 11. Magnesium:

Magnesium is commonly present in natural water as magnesium ions and when present together with calcium salts it becomes the main contributor

to water hardness. Magnesium comes to water principally through weathering of rocks. Sewage and industrial wastes are also important contributors of magnesium (Chapman and Kimstach, 1992). Like calcium the concentration of magnesium also depends upon exchange equilibrium and presence of ions like sodium. Natural softening of water occurs during percolation through soil by exchange of sodium ions. The concentration of magnesium however remains lower than calcium (Trivedy and Goel, 1986).

Table I and II shows monthly variations in magnesium contents during the period of investigation from January 2012 to December 2013. During the period of investigation the minimum value of magnesium was 11 mg/l whereas maximum was 18 mg/l.

Magnesium content was found to be lower at Site I throughout the year, maximum at Site II. Whereas at Site III it was lower than the respective preceding site. In the first year of investigation the value of magnesium at Site I ranged from 11 to 14 mg/l with an average of 11.3 mg/l, at Site II from 11 to 15 mg/l with an average of 13.16 mg/l and at Site III from 45 to 95 mg/l with an average of 16.75 mg/l. The annual average was 13.74 mg/l. In the second year of investigation the value of magnesium at Site I ranged from 11 to 17 mg/l with an average of 14.75 mg/l, at Site II from 12 to 15 mg/l with an average of 14.75 mg/l and at Site III from 14 to 17 mg/l with an average of 16.75 mg/l. The maximum value of magnesium was found during summer and minimum during monsoon due to dilution of water.

**Site I** - Magnesium contents were found to be lower than all other sites as this site is almost free of polluting elements. The only source of magnesium is the rock wherefrom magnesium salts dissolve in water during flowing of river over them. This has been suggested by Chapman and Kimstach (1992) and Meybeck et al (1992).

**Site II**- Magnesium contents were found to be high. The increase in magnesium content in water suggested that sewage was added to this region. Sewage normally contains detergents rich in magnesium ion and thus increases magnesium contents of water. The contribution of sewage to magnesium content of water has also been reported by Singh et al (1969), Munawar (1970 a, 1970 b), Bagde and Verma (1985) and Sinha et al (1991).

**Site III**- Magnesium contents were higher but lower than that present at preceding sites. This happened due to dilution of magnesium salt due to distance travelled as viewed by Jolly and Chapman (1966).

During winter magnesium salts are not found in plenty due to high solubility of magnesium salts at low temperature. A similar trend is observed in case of calcium content of water. Similar report is given by Chavan et al (2004) and Thilage et al (2005). Magnesium content gets diluted during monsoon. The dilution of magnesium content due to heavy rain has been suggested by Boznaik and Kennedy (1968), Doborn (1976), Bagde and Verma (1985), Khatavkar et al (1988), Pandey and Mukherjee (1993), Chavan et al

(2004) and Thilaga et al (2005).

ICMR (Report No. 44) has prescribed maximum permissible limit of magnesium in water to be 50mg/l. The present studies revealed that magnesium concentration at all sites remained within 50mg/l. Therefore water of River Daha may be concluded to contain magnesium ions well within permissible limit.

## 12. Nitrate:

Nitrates represent oxidized form of Nitrogen. In nature it occurs only in mineral forms such as soda nitre deposited in Chile. Most of the surface water is therefore deficient in nitrates (Trivedy and Goel, 1986). The most important sources of nitrates are the nitrogenous organic substances present in sewage and industrial wastes. Domestic sewage contains very high amount of nitrogenous compounds. Run off from agriculture field is also high in nitrate. Although high concentration is useful in irrigation but their entry into water resources increase growth of algae that triggers eutrophication. These undergo biological oxidation and produce nitrates. A good amount of nitrates is also added by nitrogen fixing organisms which fix atmospheric nitrogen into nitrates.

Tables I & II shows the variation in nitrate content during the period of investigation from January 2012 December 2013.

Fluctuation of nitrate content in River Daha is considerable which ranges from 0.15 to 0.36 mg/l with an average of 0.24 mg/l during the period of investigation (Table 1 and 2). There is subsequent increase in nitrate concentration during post winter to summer months. Site I showed nitrate range from 0.15 to 0.27 mg/l with an average of 0.21 mg/l, Site II from 0.22 to 0.33 mg/l with an average of 0.26 mg/l and Site III from 0.25 to 0.29 mg/l with an average of 0.266 mg/l. The annual average was 0.243 mg/l during the first year of investigation. In the second year of investigation the value of nitrates at Site I ranged from 0.14 to 0.25 mg/l with an average of 0.21 mg/l, at Site II from 0.23 to 0.36 mg/l with an average of 0.27 mg/l and at Site III from 0.21 to 0.30 mg/l with an average of 0.262 mg/l.

Increase in nitrate concentration during summer and decrease in its concentration during monsoon was observed during the period of investigation. It is revealed that the decrease in nitrates during monsoon is due to dilution of water of the river. Hussainy (1965), Munawar (1970 a), Seenayya (1971), Swarup and Singh (1979) and Tait et al (1984) have given similar explanation.

**Site I:** Showed very low concentration of nitrates throughout the period of investigation due to negligible pollution and human interference.

**Site II:** Showed high concentration of nitrates that might be due to disposal of sewage and immersion of human ashes at this site. The increase in nitrate contents in water due to addition of sewage has also been reported by Thresh et al (1944), Jolly and Chapman (1966), Singh et al (1969), Munawar (1970a, 1970b), Seenayya (1971), Anderson (1982), Singh et al

(1985), Trivedy and Goel (1986), Sarwar and Rifat (1991), Khatavkar and Trivedy (1992), Chapman and Kismstach (1992) and Mathuthu et al (1993).

**Site III:** Concentration of nitrate was found to be lower than that at Site II. The decline in nitrate concentration could be due to self-purification ability of river that leads to dilution of sewage along its course. Jolly and Chapman (1966) and Hunnan and Young (1974) also observed decrease in nitrate contents in water with distance traversed.

ICMR (Report No. 44) recommended maximum permissible limit for nitrates in water to be 20mg/l. WHO (1991) and Meybeck et al (1992) recommended the said limit to be 10mg/l and suggested that water with higher value of nitrates than this limit may impose significant health risk. Chapman and Kimstach (1992) observed that nitrates levels more than 5mg/l usually indicate pollution. Zafar (1959 a, 1964), Munawar (1970 b), Krenkel (1974), Singh and Sahai (1978), Anderson (1982), Michael (1984), Trivedy and Goel (1986), Adhoni and Joshi (1987), Das (1989) and Chapman and Kimstach (1992) suggested that high concentration of nitrates was largely responsible for eutrophic condition of water.

### **13. Sulphate:**

The presence of sulphates in water is due to dissolution of rocks. In natural form sulphate is present in surface water as sulphate ions. It is the oxidized form of sulphur and is quite stable. Sulphate is responsible for hardness of water along with calcium and magnesium. Sulphate content at 300–400 mg/l produces an objectionable taste in water and at above 500 mg/l water tastes bitter. It is naturally occurring anion in all kinds of natural water. Rain water has quite high concentration of sulphate particularly in the area with high atmospheric pollution. Discharge of Industrial wastes and domestic sewage in water tends to increase its concentration.

Tables I and II shows monthly variations in sulphate contents during the period of investigation from January 2012 to December 2013. During the first year of investigation the sulphate content of the river at site I ranged from 15 to 33 mg/l with an average of 22.33 mg/l, at Site II from 16 to 32 mg/l with an average of 27.25 mg/l and at Site III from 28 to 35 mg/l with an average of 31.5 mg/l. The annual average was 27.026 mg/l. During the second year of investigation the sulphate content of the river at site I ranged from 15 to 32 mg/l with an average of 24.41 mg/l, at Site II from 17 to 34 mg/l with an average of 28.58 mg/l and at Site III from 28 to 34 mg/l with an average of 32.91 mg/l. The annual average was 28.63 mg/l. Sulphate content of River Daha ranged from 15 mg/l to 32 mg/l with an average of 24.41 mg/l and was minimum at Site I and maximum at Site II throughout the period of investigation.

A clear cut trend in variation of sulphates in response to seasonal changes was not observed. Sulphate content was found to increase sometimes in summer and March as well as in winter and decrease in the month of monsoon

at all the sites. Increased sulphate content in winter depends mainly on the extent of pollutants released into water. Heavy rains during monsoon caused dilution of sulphate concentration. Similar reporting has been made by Zutshi and Vass (1978), Mitra (1982) and Khatavkar et al (1989).

**Site I** - Sulphate content was found to be low throughout the period of investigation. Here the water remained free of pollutants because none of the polluting sources was present close to this site. Therefore the small amount of sulphates present at this site came through corrosion of rocks. Thomson (1952), Bhuyan (1970), Wetzel (1975), Chapman and Kimstach (1992) and Meybeck et al (1992) have suggested weathering of rocks responsible for higher sulphate contents in water. Sulphate contents at this site remained in the range of 11.85 – 39.03 mg/l.

**Site II** - Sulphate content was found to be high due to sewage received by it. Munawar (1970 a, 1970 b), Trivedy and Goel (1986) and Sinha et al (1991) observed similarly.

The maximum permissible limit for sulphates in water has been prescribed as 20 mg/l by ICMR (Report No. 44) and as 25 mg/l by Krenkel (1974). In River Daha the sulphate content was found to be varying between 11 and 39.30 mg/l. This suggested that sulphate content remained well within the permissible limits. Wetzel (1975) observed that in natural water sulphate concentration varies from 5-30 mg/l but recently Chapman and Kimstach (1992) found this range to be between 2 and 80 mg/l.

#### **14. Phosphate:**

Phosphorous occurs in water mostly as phosphates. It is generally added to water by weathering of phosphorous bearing rock (Ruttner, 1953). The other sources of phosphates are domestic waste water particularly those containing detergents, industrial effluents and fertilizer run off from agriculture fields. The major sources of phosphorous are domestic sewage, detergents, agriculture effluents with fertilizer and industrial wastes. High concentration of  $PO_4$  is indicative of pollution. The prime concern of phosphorus lies in its ability to increase the growth of nuisance algae and eutrophication. Phosphorous as such is not harmful to organisms but its concentration in water according to US EPA (1976) should not exceed 50 mg/l. in any tributary of river or lake and 25 mg/l in main resources.

Phosphate content of Daha River ranged from 0.09 to 0.62 mg/l during the period of investigation (Table 1 and 2). During the first year of investigation phosphate content at Site I ranged from 0.6 to 0.9 mg/l with an average of 0.08 mg/l, at Site II from 0.06 to 0.10 mg/l with an average 0.08 mg/l and at Site III from 0.02 to 0.07 mg/l with an average of 0.047 mg/l. During the second year of investigation phosphate content at Site I ranged from 0.07 to 0.09 mg/l with an average of 0.075 mg/l, at Site II from 0.05 to 0.08 mg/l with an average of 0.057 mg/l and at Site III from 0.02 to 0.08 mg/l with an average of 0.055 mg/l. The annual average was 0.062 mg/l.

**Site I** - Phosphate contents were found to be low during most of the visit. This suggests that this site is free from pollution. Welch (1952), Zafar (1959a, 1969), Munawar (1970 a), Vashist and Sharma (1975), Harshey et al (1982) and Yousuf and Qadri (1985) have also reported low value of phosphates in water that was free from pollution. Similar observation have been made by Ruttner (1953), Michael (1984), Mishra (1991) and Chapman and Kimstach (1992).

**Site II** - Phosphate content was found to be slightly higher than Site I due to addition of sewage that has phosphate containing hydrocarbons. The increase in the phosphate contents due to detergent present in sewage has also been reported by Hutchinson (1975); Jolly and Chapman (1966); Saxena et al (1966); Singh et al (1969); Munawar (1970 a, 1970 b); Seenayya (1971); Hannan and Young (1974); Zutshi and Vass (1978); Anderson (1982); Trivedy and Goel (1986); Mishra (1988); Das (1989); Sarwar and Rifat (1991); Sinha et al (1992); Chapman and Kimstach (1992); Meybeck et al (1992); Ansari and Khan (2008); Einsele (1936, 1938). They also suggested that phosphates become more pronounced in water contaminated with sewage as such water has low DO. The maximum value of phosphate was found at Site II in the month of November due to discharge of some effluents. Maximum value of phosphates was recorded in summer and minimum in monsoon due to dilution of water. The value of phosphate content at 0.10 mg/l in Feb 2012 was observed to be maximum due to discharge of effluents.

**Site III** – Concentration of phosphates was found to be low to moderate due to self-purification of water on account of absence of direct sources of effluents and sewage.

Variation in the value of phosphate was observed to increase during rainy months of June and July. The increase in phosphate content during June and July might be due to inflow of phosphate content with rain water that has also been noted by Lakshminarayana (1965); Michael (1969); Rai (1974); Ruttner (1975); King (1981); Sinha and Prasad (1988); Gopal (1990); Kindangar and Ahmed (1991); Chapman and Kimstach (1992); Saradhamani and Siva Kumar (1995); Ahmed et al (1996); Kapila and Patel (1999); Sultan et al (2003); Bhaumik et al (2003); Foy et al (2003) and Kumar and Hosami (2006).

Chapman and Kimstach (1992) stated that in most natural surface water phosphate levels ranged from 0.005 to 0.2 mg/l. Strom (1930); Fritsch (1931); Rawson (1939a); Rao (1953); Zafar (1959a, 1964); Munawar (1970); Krenkel (1974); Larsen and Maleng (1976); Nakanishi (1976); Singh and Sahai (1978); Anderson (1982); Harshey et al (1982); Jones and Lee (1982); Trivedy and Goel (1986); Adoni and Joshi (1987); Hegde (1987); Das (1989) and meybeck et al (1992) suggested that high concentration of phosphates indicates pollution. Phosphate content in the range 0.23-0.94 mg/l is considered within permissible limit for surface water.



### 15. Chloride:

Chlorides are important ecological factors.

During the period of investigation from January 2012 to December 2013 chloride content was found minimum at 3.7 mg/l and maximum at 18.70 mg/l with an annual average of 7.39 mg/l (Table I and II).

Tables I and II shows variation in chloride content at all sites during the period of investigation from January 2012 to December 2013. Chloride content was observed to be low at Site I in comparison to other sites throughout the period of investigation due to pollution free water. However it was slightly higher than minimum permissible limits on Site I in few months.

During the first year of investigation chloride content at Site I was 3.99 to 6.2 mg/l with an average of 6.005 mg/l, at Site II from 5.16 to 7.21 mg/l with an average of 7.35 mg/l and at Site III from 8.12 to 9.42 mg/l with an average of 8.80 mg/l. During the second year of investigation chloride content at Site I ranged from 4.15 to 6.62 mg/l with an average of 4.25 mg/l, at Site II from 5.61 to 8.21 mg/l with an average of 6.62 mg/l and at Site III from 7.52 to 9.92 mg/l with an average of 8.49 mg/l. Maximum value of chloride was recorded in the May that declined after rains during monsoon due to dilution of water.

The chloride concentration was found to be higher at Site II that receives sewage as well as human ashes. Chloride content at Site II and III are very high during November. The increase in chloride contents due to addition of sewage has also been observed by Gonzalves and Joshi (1946), Sawyer (1960), Zafar (1964), Venkateshwaralu and Jayanti (1968), Munawar (1970a, 1970b), Badge and Verma (1985), Trivedy and Goel (1986), Adoni and Joshi (1987), A.P.H.A. (1989), Tripathi et al (1991), Chapman and Kimstach (1992), Trivedy (1992), Kumar (1995) and Yadav (2000).

At Site III chloride content was slightly lower than that at the preceding site. This site lacked direct source of pollution and the chloride of preceding site got diluted during the course of the movement of river.

Variations in chloride contents of water with seasonal changes were not discovered. Similar observation was made by Kaur et al (1996), Lakshminarayana (1965), Sitaramaiah (1966), Venkateshwarlu and Jayanti (1968), Munawar (1970 a), Patra and Nayak (1983), Tripathi et al (1991) and Saradhamani and Sivakumar (1995).

Kenwood (1920) and Venkateshwarlu and Jayanti (1968) suggested that when chloride content in a water body exceeds 5 mg/l it gives an indication of presence of organic matter. Chapman and Kimstach (1992) however suggested this value to be double, that is, 10 mg/l. Bennet (1971), Krenkel (1974), CBCWP (1982), Trivedy and Goel (1986) and ICMR (Report No. 44) have suggested that 25 mg/l of chlorides in water can safely be consumed and suggested this level to be the maximum permissible limit. Tables I and II depict that chlorides present in Daha River were in the range of 3-12 mg/l

**Table – 1, Physiochemical Properties of water collected from three spots of River Daha during 2012**

	TDS (mg/l)			PH			DO (mg/l)			BOD (mg/l)			COD (mg/l)			Conductivity (us/cm)			Turbidity (NTU)			Temperature (0 <sup>c</sup> )		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
JAN	200	216	200	7.5	7.6	7.6	7.6	7.7	7.9	1.9	2.0	2.1	10	9.0	9.5	232	215	210	16	18	15	14	14.2	14.5
FEB	215	230	238	7.6	7.7	7.8	7.2	7.5	7.4	2.3	2.1	3.5	13	11	14	200	245	289	18	18	16	15	15.2	16
MAR	186	189	198	7.6	7.8	7.8	8.2	7.8	7.4	2.3	2.0	2.5	7.4	8.0	7.9	345	367	300	40	18	15	18	21	18.2
APR	142	208	198	7.9	7.7	7.9	7.7	7.5	7.3	2.1	2.2	2.2	7.8	9	8.0	349	365	315	10	45	44	21	25.6	23
MAY	238	249	239	8.1	8.3	8.2	7.5	6.9	6.8	2.5	2.9	1.8	5.9	8	9.0	389	356	323	15	45	46	24	30.3	29
JUN	235	300	263	7.5	8.1	8.0	7.9	6.0	6.2	1.8	2.0	2.5	8.0	7.9	7.6	300	355	333	14	46	45	29	32	33
JUL	168	198	178	8.1	7.7	7.9	5.8	5.7	5.9	2.0	2.2	2.4	5.6	5.5	6.7	245	345	342	17	44	46	27	28	29
AUG	180	195	183	7.6	7.8	7.9	5.3	5.2	5.6	2.2	2.5	1.9	5.7	5.6	7.8	300	300	345	45	55	56	29	30	32
SEP	193	205	245	7.6	7.7	7.8	5.8	5.4	5.8	2.4	2.5	2.0	6.7	12	13	358	289	300	35	55	60	27	28	28
OCT	190	225	210	7.6	7.7	8.1	5.8	5.7	5.6	2.5	2.6	2.6	5.6	13	12	300	345	298	30	59	67	19	23	19
NOV	178	220	203	8.0	7.7	7.8	6.0	5.2	5.0	2.4	2.5	3.0	5.7	13	12	389	386	390	20	60	58	20	20	19.5
DEC	198	223	213	8.0	7.9	8.0	7.0	7.2	7.9	2.5	3.0	3.0	6.0	13	12	389	345	399	21	65	68	20	20	19
Avg	193.58	221.5	214	7.75	7.80	7.90	6.81	6.48	6.56	2.49	2.37	2.37	7.28	9.58	9.057	316.3	326.08	320.3	23.1	44.7	44.3	21.9	23.94	23.35

**Table – 1 (Contd.), Physiochemical Properties of water collected from three spots of River Daha during 2012**

	Total Hrdness (mg/l)			Ca Hardness as CaCo <sub>3</sub>			Ca <sup>++</sup> (mg/l)			Mg <sup>++</sup> (mg/l)			No <sub>3</sub> (mg/l)			So <sub>4</sub> <sup>-</sup>			Po <sub>4</sub> <sup>-3</sup>			Cl <sup>-</sup> (mg/l)		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
JAN	178	179	180	120	115	135	50	55	52	11	12	14	0.25	0.23	0.25	15	25	28	0.08	0.09	0.02	4.12	6.11	8.12
FEB	182	184	195	112	102	110	54	55	52	12	13	15	0.26	0.28	0.25	15	16	33	0.09	0.10	0.02	3.99	7.17	8.55
MAR	229	235	239	89	88	102	58	65	45	12	11	14	0.25	0.22	0.28	23	32	34	0.08	0.09	0.07	5.32	6.11	8.12
APR	158	168	170	102	110	105	55	56	67	13	12	15	0.22	0.23	0.26	33	32	33	0.06	0.06	0.06	5.22	7.11	9.42
MAY	156	173	171	110	89	88	56	58	59	11	13	15	0.24	0.28	0.29	23	25	29	0.08	0.09	0.05	6.22	5.61	8.62
JUN	80	175	170	120	121	119	45	50	54	11	14	15	0.25	0.27	0.25	20	26	30	0.08	0.09	0.04	5.12	7.11	8.72
JUL	93	160	155	134	124	115	55	80	80	12	14	16	0.26	0.28	0.25	23	27	31	0.08	0.07	0.03	6.15	5.16	9.32
AUG	98	130	125	100	134	123	50	88	89	14	14	16	0.22	0.24	0.29	19	28	30	0.06	0.08	0.05	5.12	6.18	8.14
SEP	102	112	108	123	133	120	68	98	90	13	14	16	0.25	0.23	0.28	25	28	32	0.08	0.09	0.04	6.11	7.21	9.11
OCT	128	130	125	125	100	90	65	90	90	12	13	15	0.27	0.25	0.25	23	26	31	0.05	0.06	0.05	5.12	7.11	9.22
NOV	146	185	175	90	90.8	120	60	95	90	13	15	17	0.15	0.33	0.27	24	30	32	0.06	0.09	0.06	4.18	6.23	9.12
DEC	166	236	201	88	89	110	87	80	95	12	13	18	0.15	0.33	0.28	25	32	35	0.08	0.06	0.08	4.12	7.11	9.17
Avg	143	172.25	167.83	109.4	107.98	110.6	58.58	72.5	71.9	11.3	13.1	16.7	0.21	0.26	0.26	22.3	27.2	31.5	0.08	0.08	0.04	6.005	7.35	8.80

Table – 2, Physiochemical Properties of water collected from three spots of River Daha during 2013

	TDS (mg/l)			PH			DO (mg/l)			BOD (mg/l)			COD (mg/l)			Conductivity (us/cm)			Turbidity (NTU)			Temperature (0 <sup>c</sup> )		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
JAN	215	210	220	7.9	7.8	7.8	7.6	7.7	7.9	2.9	2.5	2.8	15	9.6	9.5	230	315	230	15	39	36	18	14	15
FEB	218	236	238	7.6	7.7	7.0	7.5	7.5	7.4	2.5	2.5	2.9	18	15	14	330	345	259	18	18	46	19	16	16
MAR	196	190	188	7.6	7.0	8.0	8.2	7.9	7.5	2.6	2.8	2.5	20	80	7.9	335	300	360	30	23	45	14	25	18.2
APR	152	268	198	7.0	7.5	7.9	7.7	7.5	7.3	2.5	2.2	2.2	18	9.5	8.8	309	355	355	10	45	44	25	25.6	23
MAY	239	269	279	8.0	7.3	8.2	7.0	6.5	6.8	2.5	2.9	1.8	5.9	8.9	9.5	309	350	343	15	45	46	26	30.3	29
JUN	230	280	283	7.0	7.1	8.0	7.0	6.6	6.0	2.8	2.0	2.5	8.0	7.0	7.5	307	350	343	14	46	45	20	32	33
JUL	189	188	198	8.5	8.7	7.9	6.8	6.7	6.9	2.0	2.2	2.4	5.6	5.5	6.0	285	340	342	17	44	46	25	28	39
AUG	180	185	173	7.9	6.8	7.9	6.3	6.2	6.6	2.5	3.5	2.9	5.7	5.0	7.0	310	300	345	45	55	56	28	30	32
SEP	193	255	265	7.0	8.7	8.8	6.8	6.4	6.8	2.4	2.5	2.6	6.7	18	17	308	280	300	35	55	60	25	30	30
OCT	199	235	218	7.9	8.7	8.5	7.8	5.7	5.6	2.5	2.6	2.7	5.6	18	15	310	340	398	30	59	67	29	26	19
NOV	178	220	263	7.0	7.7	7.5	8.0	6.2	7.0	2.4	2.5	3.2	4.9	15	16	359	385	350	20	60	58	26	25	29.5
DEC	198	223	253	7.0	6.9	8.8	7.0	6.2	7.9	2.5	3.5	3.3	5.8	15	15	359	365	359	21	65	68	25	28	29
Avg	198.9	229.9	231.3	7.53	7.65	8.025	7.3	6.75	6.98	2.5	2.6	2.6	9.93	11.2	11.01	312.5	364.5	332	22.5	46.16	51.41	23.3	25.825	26.05

Table – 2 (Continued) Physiochemical Properties of water collected from three spots of River Daha during 2013

	Total Hardness (mg/l)			Ca Hardness as CaCO <sub>3</sub> (mg/l)			Ca <sup>++</sup> (mg/l)			Mg <sup>++</sup> (mg/l)			No <sub>3</sub> <sup>-</sup> (mg/l)			So <sub>4</sub> <sup>-</sup> (mg/l)			Po <sub>4</sub> <sup>-3</sup> (mg/l)			Cl- (mg/l)			Remarks
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	
JAN	184	197	174	122	105	138	56	55	56	12	15	14	0.25	0.26	0.28	16	26	28	0.07	0.08	0.02	4.15	6.18	8.12	
FEB	172	170	182	110	112	110	55	55	55	12	12	15	0.25	0.25	0.21	15	17	33	0.09	0.05	0.02	4.99	7.57	8.65	
MAR	150	154	145	88	89	120	57	88	55	14	14	15	0.24	0.23	0.30	25	30	34	0.08	0.06	0.07	4.32	7.11	8.62	
APR	130	152	142	106	120	101	58	56	57	12	12	15	0.22	0.24	0.28	30	33	33	0.05	0.05	0.06	6.62	7.51	8.72	
MAY	118	180	192	111	110	88	57	55	56	11	13	16	0.22	0.27	0.27	27	25	30	0.08	0.08	0.05	6.22	5.61	7.52	
JUN	131	160	165	125	126	121	55	55	54	11	14	17	0.25	0.27	0.24	20	26	34	0.07	0.09	0.05	5.12	7.11	7.72	
JUL	116	140	114	130	134	118	58	82	80	14	14	15	0.24	0.29	0.28	23	27	35	0.08	0.06	0.07	6.22	5.66	8.32	
AUG	127	125	120	105	145	112	56	82	89	15	14	17	0.22	0.26	0.26	19	28	32	0.09	0.08	0.06	5.15	5.18	8.14	
SEP	110	130	125	120	145	121	60	98	95	13	14	16	0.21	0.25	0.25	25	28	35	0.09	0.09	0.07	6.15	8.21	8.51	
OCT	112	140	115	126	123	96	62	92	92	11	13	14	0.20	0.25	0.29	29	26	33	0.06	0.06	0.08	5.12	7.15	9.25	
NOV	124	180	164	89	95	125	65	95	90	14	15	17	0.16	0.36	0.27	32	30	33	0.06	0.05	0.07	4.15	6.12	9.22	
DEC	154	190	185	88	84	115	75	82	94	14	13	15	0.14	0.33	0.29	32	34	35	0.08	0.05	0.05	4.22	6.11	9.19	
Avg	135.66	159.83	151.91	110	115.6	113.7	59.5	74.5	72.5	12.75	14.75	16.75	0.21	0.27	0.26	29.41	28.58	32.91	0.075	0.057	0.055	4.25	6.62	8.49	

that is well within the maximum permissible limit.

### **Conclusion:**

The result of present investigations indicates that the water of River Daha is neither highly polluted nor any associated disease was found. So its water is suitable for domestic, industrial and irrigation purposes along with fishing. However in some places it has found to be contaminated by discharge of industrial effluents and sewage and therefore urgent steps need to be taken in the largest interest of mankind to prevent its over pollution so that it does not lose its pristine purity. The threat to the biodiversity of this river arises from the rapid increase in human population coupled with high illiteracy and unemployment of a sizeable population that results in increased urbanization along the river bank resulting in high pollution load in the river. Since the river protects the treasures of Nature in the form of supporting its biodiversity, preserving genetic diversity, and sustaining species both vulnerable and non vulnerable, necessary steps should be taken to preserve the natural state of this river for which the support of surrounding population and joint efforts of scientists, environmentalist, aquarist and students is highly desirable. One should never forget that after air water is the most important resource gifted by nature to man for his survival and its wastage, contamination and pollution will seriously affect his living both in the short as well as long run. So the protection of all rivers and not only River Daha remains a major task for man for maintaining a balanced ecosystem already gifted to man by Nature.

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## **A Geographical Study of Variables Characterizing drainage patterns in Paschimi Champaran District**

\* Binod Kumar Yadav

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***Abstract-** In this present paper an attempt has been made to analyze "A Geographical study of variables characterizing drainage patterns in Paschimi Champaran district". The study is based on the use of secondary data : In terrain analysis, drainage systems are important components. Due to local topography and subsurface geology, a drainage system achieves a particular drainage pattern based on the form and texture of its network of stream channels and tributaries. Drainage pattern recognition helps to provide a qualitative description of the terrain for analysis and classification and is useful for terrain modelling and visualization and applications in environment.*

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**Key Words-** Drainage pattern, Terrain Analysis, Drain ability, Drainage density and texture

**Introduction:** The flow of water through well-defined channels is known as 'drainage' and the network of such channels is called a 'drainage system'. The drainage pattern of an area is the outcome of the geological time period, nature and structure of rocks, topography, slope, amount of water flowing and the periodicity of the flow. Inside a river network, different patterns can be observed and related to other geographical factors. In a drainage basin, a number of factors such as topography, soil type, bedrock type, climate and vegetation cover influence input, output and transport of sediment and water (Charlton, 2008). These factors also influence the nature of the pattern of water bodies (Twidale, 2004). As a consequence, drainage pattern can reflect geographical characteristics of a river network to a certain extent.

**Objective of the study:** The general objective of this study is meant to clearly jot down the aspects of drainage in the district. It further indicates the impact of the characteristics of drainage on the physical and socio-economic landscapes of the study area.

**Methodology:** The following procedures from the methodological point of view have been adopted in the present study

- (i) Observational descriptive
- (ii) Observational relational and

Here drainage analyse has done by using statistical techniques based on valid and scientific principles as far as possible. The cartographic techniques

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\* Ph.D., Department of Geography, J. P. University, Chapra

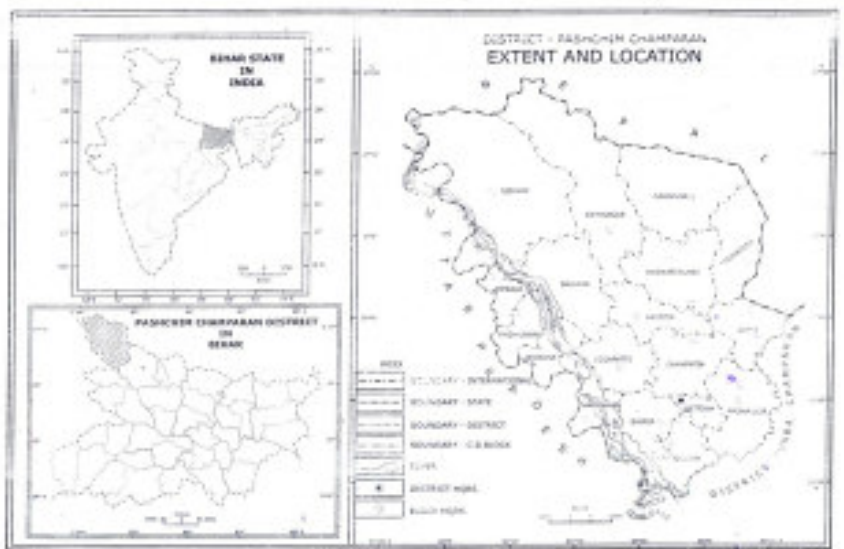
have been used to depict the drainage pattern.

**Sources and limitations of data:**

The data for the present work have been collected from the diverse sources. The field visit and observation as well as the area measurements have been the main source of the data. The secondary data from the Government metrological sources have been collected. The reports on the River system prepared by the Government of Bihar have been consulted. In lack of temporal data, time analysis of the Drainage features had suffered.

**Study Area :**

Geographically, Paschimi Champaran district is situated between 26°35' and 27°32' north latitudes and 83°50' and 84°85' East longitudes. This district encompasses an area of 5228 sq. kms. and comprises 36 Lacs population according to 2011 census. As the district has its border with Nepal it has international importance. The area of study is traversed by many streams.



The behaviour of drainage is governed by the general lie of the land. The general slope of the area is roughly from north-west to south-east. Drainage has actually played a key-role in developing many seen and unseen characteristics of the area. A General manifestative feature, available throughout the length and breath of the study area, is that almost all streams meet its trunk river at acute-angles. These form closely-spaced parallel or sub-parallel drainage lines to the main stream. Almost all rivers have its sources either in the middle Himalayas or Siwalik Himalayas.

The district is primarily drained by two sets of rivers. The Gandak and the Sikarashtra or Burhi Gandak. Nearly 4/10 the of its area is served by the Gandak agglomeration and rest part by the Sikarashtra group. There is a water divide which separates the two groups. Rivers of both these groups have formed different morphology and physiognomy within the district. Thus,

drainage system has provided distinct alluvial morphological units, each standing out with its topographic, hydrologic and pedogenic differentiations in accordance with the river regimes.

Except the Gandak, almost all rivers are rain fed. The average annual receipt of rainfall has considerable fluctuations in space-time relation. Hence, these rivers carry unusually disproportionate amount of water in its flow through out the year. During the rainy season streams are in spate and carry very heavy discharge which dwindles down to negligible quantities in fair weather. The geological unstableness and the friable nature of the terrain cause considerable meandering or drastic changes in their courses. Uncertainty and capriciousness in their behaviour. It is the most vital factor for recurring visits of floods telling upon the vitality of the district. To contain the menace posed by these torrential as well as sluggish streams through canalization of its water in the form of irrigation for the benefit of the district is a factor of utmost consideration if there is any genuine desire to uplift the area growing in darkness.

To ascertain the irrigable potentiality of surface water of the area, a precise knowledge of various flowing rivers and rivulets is essential charting out of various Canals, distributaries, sub-distributaries and field channels are governed by the drainage lines. Hence, its description is given.

**Gandak River :** The Gandak is perennial river coming from the middle Himalaya. It flows along the western margin of the district roughly in north-south direction. It descends the district near Triveni in Sidhaw block. Its most remarkable features is absence of any important tributary to it. Instead, there are a number of its own old beds, distributaries and spill channels. The Gandak, formed by the confluence of seven streams (Sapt Gandaki) and having a maximum flood discharge of 555460 cusecs (recorded in 1924), has a higher gradient (18 cm per km) than the Ganga or the Ghaghara river. Their catchments comprises the central part of the snowy Nepal and Tibet Himalaya. It is notorious for its floods. Inundation and frequent shifting of its courses have been the great problem for the area both sides of it. It has actually created Diara like situation especially in Madhubani and Thakarahana blocks. The Gandak and its spills deposit the micaceous sands, also silt sometimes. The plain formed by this system appears like a cone which Geddes calls the "Gandak Cone".

**Sikrahan River :** The Sikrahan or Burhi Gandak is another important river passing through the heart of the area. The Burhi (Old) Gandak flows parallel to and east of the Gandak River in an old channel. It originate from chautarwa chaur and fed by many swift flowing tributaries. It is a continuation of the Mangurama river. It is notorious for its flood. It tends to erode one bank and silting the other bank. This function goes on till the 'loop' attains a circular shape- such a topographical feature is noticeable near Chanpatia. Its main tributaries are Masan, Belor, Pandai, Uria etc. The Total length of the river is



320 km. The drainage area of the river is 10,150 square km.

**Masan :** It is very notorious for its flood discharge. At the place of its origin, it is called Harsa river. Originating from the Someshwar range it is fed by Sanctiani Khola, Dhair Khola, Khudi and the Kapan rivers. It joins the Sikarahna near Basantpur after crossing Raxaul- Bagaha, Railway embankments through bridge. While in spate, it brings huge amount of Sands and deposits them in the adjoining fields and thus depriving them of their fertility. It alone contributes nearly 1/3<sup>rd</sup> year of Sikarahna's total discharge.

**Belor** – Belor is another hilly rivulet formed by the RamRekha, Belor, Dhongai and Harbola rivers. It meets Sikarahna at Matiriaghat after passing through a railway bridge of even vents of 12m height in Narkatiaganj-Bagaha section.

**Pandai** – It originates in Nepal and enters the district through a pass between Someshwar and Churiaghat. It meets Sikarahna at Tulaghat. It is also famous for its swirling currents.

**Uria :** This river flows due Southward from Nepal for 19 kms. It then turns south and meets Sikarahna, near peparpantighat. It has three important tributaries namely, Sikta, Kangali and Gadh. It also discharge heavy water.

**Hydrolic Regime :** - By hydraulic regime we mean the total amount of water and its flow during the run of the year. Receipt of the total seasonal precipitation, incidence of snow fall, underlying rocks, underground storage of water and the rate of the seasonal variations in evaporation altogether determine the behaviour of the hydraulic regime. Except the Gandak river, almost all rivers are rained. Even then, the majority of them are perennial by virtue of its hydraulic regime. The level of water table varies from time to time. It remains high in the district in relation to Dharbhanga, Samastipur, Begusarai and Muzaffarpur all located in Mithila plains. Here it varies between 2.74 m and 4.72 m throughout the year. The mean level of water table is 3.73 m or 12.33. Such a high level of water table reveals probability of huge reserve of sub-terrene water. Two American Scientists of Geological Department of America, who estimated underground potential water resources of the Gangetic Valley, arrived at the same conclusion. It is thus fit for the drilling of tube wells and wells at the minimal cots.

**Drainage Density & Texture :** The study of the hydraulic regime gives broad idea about the over all water position of the area. The actual knowledge of the actual storage of water in different parts of the area can be ascertained only through the study of drainage density and texture.

Drainage density ( $D_d$ ), expressed as a ratio of the total channel length of streams of all orders in a basin to the basin area, was introduced as an important morphometric parameter by Horton (1932). Frequency of streams in any part or the area as a whole is termed as drainage texture. High drainage density gives rise to a fine drainage texture, while low drainage density results in a coarse texture (Strahler, 1964). The drainage density of the Paschimi Champaran has been studied by an expert team of the Geology dept. of Patna

University. According to findings reports of the survey work four categories have been recognized. Six northerly blocks such as Sidhaw, Bagaha, Ram Nagar, Gaunaha, Mainatanr and Narkatiaganj have drainage density of 0.58% per Km<sup>2</sup>. Sikta, Lauria, Thakarahan, Madhubani and Bagaha blocks have 0.42% per Km<sup>2</sup>. Nautan, Bairia and Jogapatti have 0.31% density per Km<sup>2</sup>. Bethiah, Chanpatia and Majhulia have 0.13% density per Km<sup>2</sup>. Conclusion derived from the above description is that higher the density, finer is the texture and finer the texture, there is possibility of huge potentiality of water resource. By the study it is clear that the northern part of the district, roughly to the north of the Triveni extension canal, has medium drainage density and fine texture position. It means that this part receives high incidence of rainfall. The minimum density per Km<sup>2</sup> is found in area between the Gandak and the Sikarahnna river. It declines further towards South and the South-east on the basis of it, Suitable cropping case be adopted to extract maximum production.

**Drainage Pattern :** The feature of drainage system is also not uniform dendritic pattern is seen in the hilly northern part. Harbola, Pandai, Sonara, Manora, Bhabsa and other small rivulets form parallel pattern. The ambiguous Semi-deltaic pattern is visible especially in the tract delimited by the Gandak in the north and the Pandai in the east. A notable single-sided pinnate like arrangement has been formed by Belor, Harsha and other rivers also.

**Drain Ability :** The knowledge of drain ability is prima-facie important for the application of irrigation as well as the times of application. Poor drainability affects adversely the prospects of cultivation. It begets water logging on large scale affecting land use in general and cropping in Particular. Sidhaw, Ramnagar, Gaunaha and Mainataner reveal relatively good drain ability condition while as the rest blocks manifest more or less poor drain ability. Sikta,



Majhulia, Nautan and Chanpatia have very poor drainability conditions. River mostly flow through ridges formed by them themselves. Intervening area resemble soucer – like consequently, rivers are unable to follow the common base- level of erosion. High incidence of seasonal or periodic rainfall adds new feather to the problem. Madhubani, Thakarhan, Bairia and Nautan have altogether 45% of the total water logged tracks of the district. In Tarai belt, this phenomenon is uncommon. Sikta is, however, exception to the rule. Nearly  $\frac{1}{4}$  the area of this block remains water logged for the whole years, the famous Tapas Bahas' is here. Some parts of Majhulia and Bagaha are also water logged. Here cause of water logging is not only the irrigation methods but its physical conditions also breed this situation.

**Conclusion:** Although there are many benefits to living near streams, settlement along a river has its risks, Particularly in the form floods.

The advantage of this work is that proposed geometric quantitative indicators are easy to obtain and calculate. Except the river network data itself, no other information about the terrain is needed. Validation of the results is based on assessments done on case studies. One limitation is that the qualitative description of the patterns relies on quantitative variables and depends on threshold values set by the users.

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## A Study of liquidity of I. T. Companies in India

\* Gathani Nirali S.

\*\* R. K. Dave

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**Abstract-** *In the day to day business of a company, a factor which is used most is working capital. A capital which is used for routine business is known as working capital. And a ratio shows the position is liquidity ratio. The liquidity ratios shows liquid position of the company. There are various ratios included in liquidity ratios like Current ratio, Quick ratio, Absolute liquid ratios etc. Every ratio has its own use and own ideal measurement to have the sound liquid position of working capital.*

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**Key Words-** Current ratio, Quick ratio, Absolute liquid ratio, Absolute liquid assets, Current assets, Current liabilities, Quick assets etc.

**Introduction:** Liquidity plays a role in determining the profit level of the company, and maintaining liquidity is the key factor whether it is involved in the customer convenience and satisfaction. It should be keep adequate level if the management is likely to confront an uncertain environment but how low or how high is the basic question. The assets of the company can be financed by owner or the loaner and depositors. Maintains both liquidity and profitability decision is significant managerial decision, as it influences the shareholder return, risk, and customer satisfaction. Market share is also affected by these items. The bank has to plan its liquidity initially at the time of its promotion. Subsequently, whether the funds have to be raised, a profitability decision is involved.

**Objectives:**

- To study the liquidity of sample.
- To provide a reference to the future researchers.

**Scope of the study:** The study can be expanding up to each and every companies registered under companies act in the world. Other industry's companies can also be taken for the study. Also other ratios can also be taken for the study.

**Sample Size:** The researcher has taken two I.T. companies to analyse the liquidity and the five years data has been collected from 2012-13 to 2016-17.

**Data Collection:** The researcher has collected secondary data for this research.

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\* Ph.D. Research Scholar, Saurashtra University, Rajkot, Gujarat, India

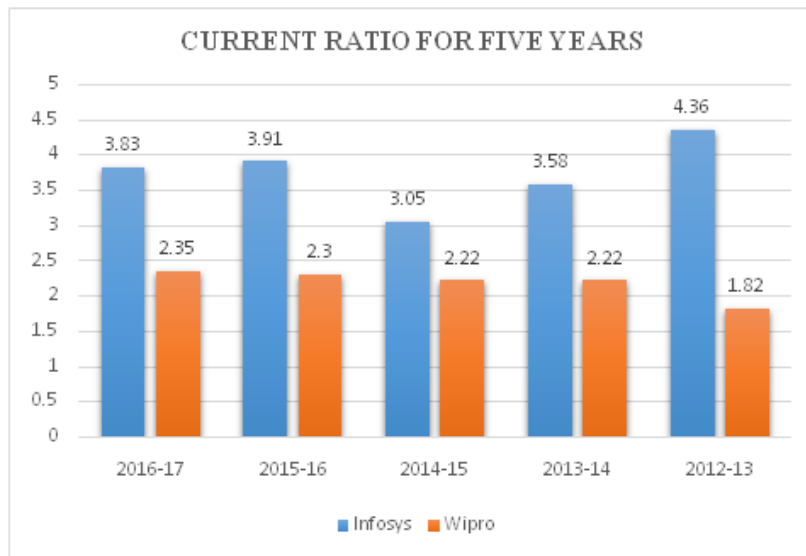
\*\* Principal, Yogiji Maharaj Mahavidyalay Mahila Arts & Commerce College, Yognagar, Dhari, Dist. Amreli, Gujarat, India

The data has been collected from annual reports, articles, books, journals etc.

**Ratio Analysis:** For studying the liquidity of the sample companies, the researcher has used three ratios by which the liquidity can be studied. The ratios are Current ratio, Quick ratio and Absolute Liquid ratio.

**Table: Current Ratio For Five Years**  
(Amount in times)

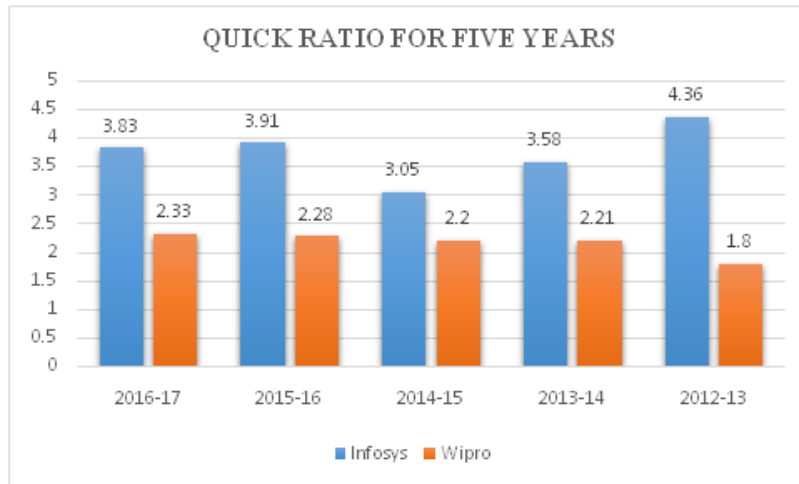
Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	3.83	3.91	3.05	3.58	4.36
Wipro	2.35	2.30	2.22	2.22	1.82



**Interpretation:** Above table is showing the data regarding current ratio of Infosys and Wipro for the five years from 2012-13 to 2016-17. The ideal measure of current ratio is 2:1 which means if a company have 2.00 times current ratio, the position is said to be proper and sound compared to this ratio. If more value is there than ideal amount, there is ideal current assets exist and if the low value is there than ideal measure, the current liabilities exist more. Here, for the Infosys, its ratio for all five years are more than 3.00 which means there must be excess of current assets than whatever is needed. But in the Wipro the value of ratio is nearer to 2.00 in every years. Which can be said as quiet sufficient level of working capital in the company.

**Table: Quick Ratio for Five Years**  
(Amount in times)

Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	3.83	3.91	3.05	3.58	4.36
Wipro	2.33	2.28	2.20	2.21	1.80

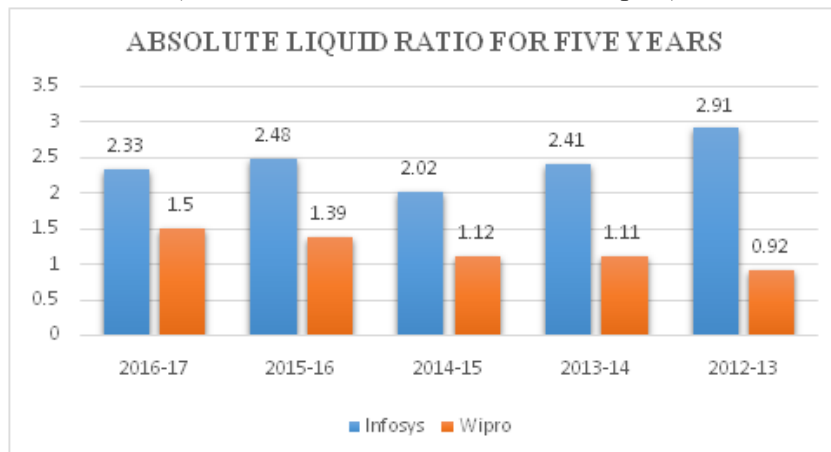


**Interpretation:** Above table is showing the data regarding quick ratio of Infosys and Wipro for the five years from 2012-13 to 2016-17. The ideal measure of quick ratio is 1:1 which means if a company have 1.00 times quick ratio, the position is said to be proper and sound compared to this ratio. If more value is there than ideal amount, there is ideal quick assets exist and if the low value is there than ideal measure, the current liabilities exist more. Here, for the Infosys, its ratio for all five years are more than 3.00 which means there must be excess of quick assets than whatever is needed and in the Wipro the value of ratio is nearer to 2.00 in every years which is also higher value than the ideal measure.

**Table: Absolute Liquid Ratio for Five Years**  
(Amount in times)

Company	2016-17	2015-16	2014-15	2013-14	2012-13
Infosys	2.33	2.48	2.02	2.41	2.91
Wipro	1.50	1.39	1.12	1.11	0.92

(Source : Calculated from Annual Report)



**Interpretation:** Above table is showing the data regarding Absolute Liquid

ratio of Infosys and Wipro for the five years from 2012-13 to 2016-17. The ideal measure of absolute liquid ratio is 1:2 or 0.5:1 which means if a company have 0.50 times absolute liquid ratio, the position is said to be proper and sound compared to this ratio. If more value is there than ideal amount, there is ideal absolute liquid assets exist and if the low value is there than ideal measure, the quick liabilities exist more. Here, for the Infosys, its ratio for all five years are more than 2.00 which means there must be excess of absolute liquid assets than whatever is needed and in the Wipro the value of ratio is nearer to 1.00 in every years which is also higher value than the ideal measure.

**Conclusion:** From the above data, it can be concluded that every company should maintain the ideal and sufficient level of working capital to have a smooth running business and a sound liquid position. If there will excess of current assets than it will be of no use and the profit earned through such assets cannot be there with the company. And if current liabilities will be more then it directly will increase the debt of the company. Hence, a proper amount of working capital should be maintained to have a sound liquidity position in every companies.

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## **Study on Psychological Characteristics of Badminton Players Participated in Different Levels**

\* Ravi Singh  
\*\* Pankaj Pandey

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***Abstract-** The objective of present study was to examine psychological characteristics of different levels of badminton players. Total one hundred fifty badminton players were the participants of present study. The subjects were divided into three categories 1.) university players, 2.) district level players and 3.) state players. Only male badminton players who had participated from 2015 onwards were selected as participants for the present research work. The psychological characteristics (Sports Competition Anxiety and Sports Aggression) were selected for the present Study. Scholar had used authentic psychological questionnaire for psychological characteristic, i.e. Sports Competition Anxiety Test Questionnaire developed by Rainier Martin, Sports Aggression Inventory developed by Prof. Anand Kumar and Mr. PremSankar Shukla . For the data analysis one way analysis of variance (ANOVA) was applied and level of significant was fixed as 0.05 levels. The significance difference was found among the district players, university players and State players in relation sports Aggression whereas insignificant difference was found among the district players, university players and state players in relation to sports competitive anxiety.*

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**Key Words- Anxiety, Aggression, shuttlers**

**Introduction:** Sport provide a service to the individual by preparing him or her to meet the challenges of life and career .The preparation includes an overall fitness, wholesome personality and competency to live in a democratic society. It is only in organized sports that the participants can accurately be termed as “Athlete”, whose behaviour manifests intense, seriousness of purpose while his movements in the arena of sports competition remain dependent on several external controls.

“Psychology is field which deal in behaviour of individual and behaviour is collective effort of activities done by the person”. Psychology denoted as complete science as well as an art. The study of the individual behaviour in relation to his environment is known as psychology. The psychology works on what, why and how makes person to act or perform in different situation, It studied on impacts of environment which force to individual behave in

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\* M.P.Ed. Scholar, Amity University, Noida

\*\* Assistant Professor , Amity University, Noida



different ways. Now a day's analysis of behaviour is more scientific.

According to **John D.** "Sports Psychology is an area which attempt to apply psychological facts and principles to learning, performance and associated human behavior in the whole field of sports".

Anxiety has been defined in variety of ways such as disturbed state of body (Johnson1951), nervousness (Ekegami1970), and neuroticism (Kane 1970). A variation of physiological responses such as increase heart rate, rapid shallow breathing, sweating and muscles tension are associated with anxiety.

Aggression is defined as the infliction of an oversize stimulus either physical, Verbal or gestural upon one person by another. Aggression is not an attitude but behaviour and most critically it is reflected in the acts committed with the intention to injure.

**Methodology:** The purpose of the study to compare psychological characteristics of three different level badminton players i.e. university level, district level and state level. The following methodology was adopted to achieve the objectives of the study:-

**Selection of participants:** A total number 150 badminton players were the participant of this study. The subjects were selected from three states Uttar-Pradesh, Delhi and Haryana .The subjects were divided in three category university level, district level and state level.

**Selection of Variables:**

S.No.	Variables	Teat items
1	anxiety	Sports Competition Anxiety Test prepared by Reiner Martin
2	aggression	Sports Aggression Inventory prepared by Prof. A. K. Srivastava and Mr. Prem S. Shukla

**Statistical Techniques employed for the Analysis of Data:** To find out the relationship of selected psychological characteristic of different levels of badminton Players, One way Analysis of Variance (ANOVA) was used at 0.05 level of significant.

**Result and analysis of data:**

The data was analysed using ANOVA (one way analysis of variance) method to find out relationship of psychological variables of different levels of badminton players are shown in Tables-

**Table-1**

**Analysis of Variance of Sports Competition Anxiety Test (SCAT)  
Among Different Levels of Badminton Player**

Source of variance	Degree of freedom (df)	Sum of squares ( S.S.)	Mean squares ( M.S.)	F-Ratio
Between the group	2	3.507	1.856	0.296
Within the group	147	946.58	6.456	

Table-1 revealed there were no significant difference found in the various levels of shutters in related to Sports Competition Anxiety test (SCAT) as F-ratio was obtained 0.296, tabulated value higher than the f value. the tabulated value is 3.06 at 0.05 level with (2,147) degree of freedom.

**Table-2**  
**Analysis of Variance of Sports Aggression among Different Levels of Badminton Players**

Source of variance	Degree of freedom( df)	Sum of squares(SS)	Mean squares( MS)	F-Ratio
Between the group	2	19.567	9.56	5.409*
Within the group	147	265.23	1.75	

\*Significant 0.05 levels  $F_{0.05}(2, 147) = 3.06$

Table-2 shown that significant difference was found in various levels of shutters in related to Sports Aggression as obtained value of F-ratio was 5.409 which was higher value than tabular value 3.06,

As the ANOVA was found significant in relation to aggression, the LSD test was applied to find out differences of the means amongst various level of badminton players were significant.

**Table-3**  
**Least Significant Difference Post -Hoc Test for the Means of All Different Levels in Relation to Sports Aggression**

Means (M)			Mean Difference (M.D.)	Critical Difference (CD)
University Players	District Players	State Players		
7.05	7.89		0.84*	0.536
7.05		7.70	0.65*	
	7.89	7.70	0.19	

\*Significant at 0.05 levels

table-3 It is evident from mean difference of various level in relation to aggression was found statistically significant between university players and district players, university players and State players. Mean difference between district and state players did not prove to be significant 0.05 levels.

**Discussion and conclusion:** F-value for Sports Competitive Anxiety is .296 which is found insignificant. It means Sports Competitive Anxiety mean different levels of shutter do not differ significantly because players of university, district and state had approximately equal Anxiety. This may be attributed to the fact that all these shutter were quit matured since the game of badminton now very popular and players participate in various competitions and matches extensively. The regular participation of these players may have developed the sports competitive anxiety optimally. Thus no significant difference was found in no significant difference of psychological characteristic (Sports Competitive Anxiety) among different levels of badminton player is not rejected. It may therefore be concluded that all the different level of badminton player were found to have similar Sports Competitive Anxiety in

players. The present findings is also supported by **Anne Lacy ,Debnath and Bawa**.A good level of controlled Sports Aggression is prerequisite to the badminton players .As for as the Sports Aggression was concern a significant difference was found among the district players, university players and State players. Whereas there was statistically insignificant difference found between the district and state players. The players of district level and state level players belong to nearly similar category and hence these players exhibit similar Aggression. Which is also supported by the studies conducted by **Isberg Leif, Wildmeyer and Birch**.

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## **Effect of Different Foot Spacing in Crouch Start on Acceleration Speed of Sprinters**

\* Nibu R Krishna

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***Abstract-** Track -and -field athletics is the oldest forms of organized sport having developed out of the most basic human activities - running, jumping and throwing. Athletics is one of the most popular international sports, in which a large number of countries in the world used to participate in the International level. Athletics Association of various counties sends their athletes to the Olympic Games and to the official world championships of Track and Field. In the 2007 World Championships in Track and Field held in Osaka, Japan, the difference in time between first place and sixth place in the women's 100 meter dash was less than.1 seconds. With such a miniscule amount of time separating a gold medal from no medal at all, there is no room for error. An important piece of the 100 meter dash is the initiation of movement, or the start. The importance of the sprint start does not merely end when the sprinter leaves the blocks. The force, velocity and positioning of the body from the start have an effect on the acceleration phase of the sprint, and eventually the outcome of the race.*

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**Key Words-** Athletics, Track, Field, Running, Jumping, Throwing

Different aspects of the start, such as angles of the hip, knee and ankle angle of the pedals and longitudinal spacing of the feet have all been studied. One of the most common variables researched is the variance in the spacing from the starting line to the feet. The three common types of longitudinal spacing are the bunch, medium and elongated starts.

In the modern scientific age athletic use being trained by highly sophisticated means for better achievement in their concerned sports and they are being exposed to the exercise and training methods which have proved beneficial for achieving higher standards. Since the days of Grecian foot races, many important innovation and consequent developments have been made concerning the shorter sprint races. Two of these the introduction of the crouch start and the universal acceptance of starting block were instrumental in providing a basis for improved techniques and resultant lower elapsed times. All the sprint events “starts” play an important role, winning an event largely depends upon the type of start taken by an athlete. For sprinters, the start means half the race. The winning margin of most sprint races rarely exceeds

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\* Assistant Professor ,LNIPE, Gwalior

a few centimetres. If a sprinter can gain even slight edge at the start, he has a great advantage over his opponents in sprints. Since a good start is important, it can be developed by constantly practicing the proper method until it is mastered and by keeping in mind that a good start is not only speed from the block but that will carry the sprinter to full sprinting stride in the Fastest Fashion.

The coaches and sports educators should realize the importance of acceleration in sprint events therefore, the research scholar have made an attempt to find out influences of synthetic surface on acceleration by using bunch, medium and elongated crouch start. Once the appropriate starting position is determined the physical education teachers and coaches will be able to employ the synthetic running surface and effective position for better acceleration and improvement on sprinting performance.

**Purpose of the Study:**

The purpose of the study was to find out the effect of different foot spacing in crouch start on acceleration speed of sprinters on synthetic surface.

**Methodology:**

For the purpose of the study a total of 10 Female Sprinters age ranged from 18-25 years, belongs to Lakshmibai National Institute of Physical Education, Gwalior who had represented the University at the All India Inter University level were selected as subjects. For measuring acceleration, the distance was delimited to 30 meters only. Thirty meters run was employed to measure acceleration speed of the subjects in the bunch, medium and elongated crouch start on synthetic surface.

**Criterion Measures:**

The criterion measures adopted for this study was acceleration performance of each subject on synthetic surface by using bunch, medium and elongated crouch starts recorded in terms of time taken over a distance of 30 meters to the nearest one hundred of a second.

**Statistical Analysis:**

The data was analyzed by applying one way analysis of variance (ANOVA). The level of significance was set at 0.05.

**Findings:**

For the chosen distances of 30m acceleration by different foot spacing in crouch start, the data were subjected to Descriptive, Levene statistics and one way Analysis of Variance (ANOVA).

The data was subjected to Descriptive statistics to find out the mean difference on 30 meters acceleration by different foot spacing in crouch start (Bunch, Medium and Elongated). The Descriptive statistics are shown in Table No.1. The mean time for Bunch start was 4.30 sec, for medium start the mean time was 4.20 sec and for elongated start the mean time was 4.26 sec. Bunch start has the least variance. The level of significance was at .05.

**Table – 1**  
**A DESCRIPTIVE STATISTICS OF THE DIFFERENT FOOT SPACING IN CROUCH START OVER THE DISTANCE OF 30 METERS ACCELERATION**

Foot Spacing	N	Mean	Std. Deviation
Bunch	10	4.3070	.06447
Medium	10	4.2090	.10300
Elongated	10	4.2680	.12081
<b>Total</b>	<b>30</b>	<b>4.2613</b>	<b>.10388</b>

The data was subjected to Levene statistics to test the assumption of homogeneity of variances. The P-value was found .179 which is greater than .05 which means the Null hypothesis of equality of variance was accepted. Hence the assumption is fulfilled. The Levene statistics are shown in Table No.2.

**Table – 2**  
**THE LEVENE STATISTICS TEST OF HOMOGENEITY OF VARIANCES**

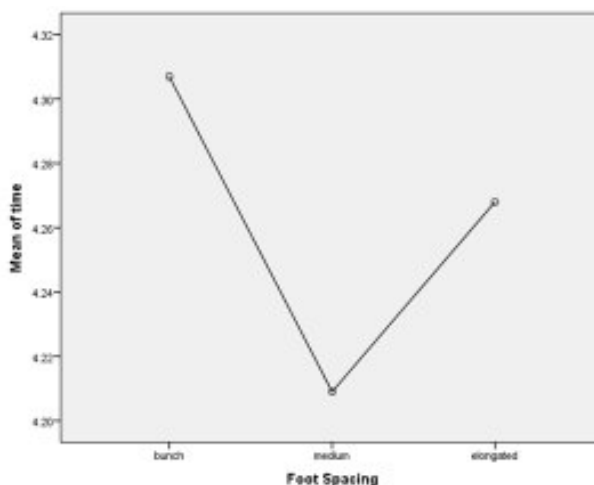
Levene Statistics	df1	df2	Sig.
1.834	2	27	.179

The P-value for ANOVA was found .102 which is greater than the level of significance .05. There was no significant difference was found between the varied foot spacing in crouch start on acceleration speed of sprinters on synthetic surface. The data on one way Analysis of Variance of the different foot spacing in crouch start over the distance of 30 meters acceleration is shown in Table No. 3.

**Table – 3**  
**ANALYSIS OF VARIANCE OF THE DIFFERENT FOOT SPACING IN CROUCH START OVER THE DISTANCE OF 30 METERS ACCELERATION**

Variance	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.049	2	.024	2.487	.102
Within Groups	.264	27	.010		
Total	.313	29			

\* Level of Significance at .05.

**Mean Plot:**

The mean time (in seconds) for Bunch foot spacing was 4.3070, for Medium foot spacing was 4.2090 and for Elongated it was 4.2680. Hence Medium foot spacing was better when compared to Bunch and Elongated foot spacing.

**Conclusion:**

The study examined the effect of varied foot spacing in crouch start on acceleration speed of sprinters on synthetic surface. The findings of the study revealed that Medium foot spacing is superior to other two foot spacing (bunch and Elongated) for acceleration up to a distance of 30 meters. Every athlete had sprinted in less time from the medium starting position than from either the bunch or the elongated foot spacing. There was no significant difference in the time taken to accelerate the 30 meters distances from the bunch and the elongated foot spacing in crouch start positions, this may be because of small sample size, level of the athletes, different reaction ability of the athletes, different anthropometric variables of the athletes etc. When the individual trials were studied, the largest number of fastest acceleration were made from the medium foot spacing crouch start, the next largest number from the bunch foot spacing crouch start and the smallest number from the elongated foot spacing crouch start.

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## **Arun Sarma's 'Ashirbador Rang': a critical discussion**

\* Jumi Das

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*Abstract- Novel is the creation of an artist with a modern mind. It is completely based on reality and happiness as well as grief of human life. The definition of the Novel can be given in an other way; it is a long story in a specific language created from the realities of life with a sweet touch of imagination.*

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**Key Words- Assamese literature, Novel, Riots**

The later decades of 19th century is considered as perfect time of the birth of the novel in Assamese. 'Bhanumati' (1891) of Padmanath Gohai Baruah, Lahori (1892), ' Padumkuwari'(1905) of Lakshiminath Bezbaruah are some of the novel Which established the foundation of modern Assamese Literature. After, the second world war 1939, Assamese literature acquired a new dimension in the modern scenerio. At this time in the field of Assamese novel literature Birinchi Kumar Baruah provided a new direction. 'Jibonor Batot,' a novel by Brinchi Baruah is a history of one century where Assamese life history is reflected in its humorous pictures of riots. After that, a lot of eminent modern novelists were born and in the first part of 20th century Arun Sarma is one of the novelists who demanded his success in writing novels.

### **A brief introduction about Arun Sarma:**

In Assamese literature, Arun Sarma is regarded as one of the succesful novelists who was born in 1931, at Dibrugarh, Senduri Ali. His father's name was Tilak Ch. Sarma and mother's name was Narmada Kumari Devi. In 1948, he passed his matriculation from Tezpur Government High School. In 1951, he passed I.S.C examination with flying colours from cotton college. He passed degree from cotton college in Education in 1955. Arun Sarma was them appointed in the paper 'The Assam Tribune' as an analyser of sample paper and after that, in 1955, he joined as a teacher in Borongabari Madhya Saiduwar High School in Sonitpur district. In 1959, he married the grand daughter of Chandra Kanta Sarma, Arati Sarma of Uzan Bazar Guwahati. In 1960, he left his teaching job and joined as a programmer in Guwahati Radio centre. In 1986, he was appointed as an incharge of Dibrugarh Broad casting centre. In 1989, he got retired from North-East Broadcasting centre as a programmer. In 1989, the three day newspaper 'Purbanchal' appointed him

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\* Bajali colleg, Assamese Department

as an editor and after that in 1991, he was appointed as a chief consultant of Indian Tea Association in the public Relation department.

The career of Arun Sarma is a vast one. In 2002, he was appointed as a working member of the Executive committee of IGNOU and in 2002 itself he was appointed the president of “Assam Drama Association” for two years. Arun Sarma was also the advisor of Sankardev Kalakhetra Drama society. In 2002-03, he was the member of North-East cultural Association. In 2005, he was elected as the Art Director of Srimanta Sankardev Kalakhetra’s ‘Sabdajyoti Programme.’ In 2006, he was elected as a member of Assam Cultural Association and also in 2007, he was elected as a member of Assam Sahitya Academy. In 2008, National Drama School organised International Drama competition and Arun Sarma was elected as the member of the drama selection committee. In 2009 he was the member of Advisor committee of Assam publishing house. After all these responsibilities, Arun Sarma is elected as the secretary of centre for Development of peace studies.

A special recognition was given to Arun Sarma in 1967-68, because of his drama, ‘Sri Nibaran Bhattacharjya, from Assam Sahitya Sabha, and was awarded the best Assamese Drama. In 1979, he got a prize in ‘Japan Prize International in Radio-drama competition in Japan for his drama, ‘All Buds to Bloom.’ In 1982, he got an award from ABU (Assam pacific Broadcasting Union) for his drama caution, ‘Danger Ahead.’ In 1983, a documentary named ‘All Lips to Smile’ earned him ‘Pra Future Berlin’ and also earned him special recognition certificate.

Arun Sarma received Sahitya Academy Award for his novel ‘Ashirbador Rang’ in 1998. In 2001 he received Assam Drama congress Awarded. In 2003, he got Sangeet Natak Academy Award for his lifelong exercise in drama. In 2003, Arun Sarma was conferred poet Sailodhar Rajkhowa Award. In 2010 he received Padmasri and in 2010 he got Swami Sankaracharya National Sahitya Award.

#### **The Features of Arun Sarma’s Novels:**

Acute humanism and collective protest against exploitation are the main ideals of Arun Sarma’s novels. They artistically reflect the natural beauty of the rural life of Assam as for example in ‘Ubhala Sipa’ and Ashirbador Rang.’ Moreover, his novels also show how capitalist economy had affected the village life and how a new generation with its values had grown there. Arun Sarma’s novel reflect the changes that occur in the rural life. They also portray the intolerance and degradation of human values in the current political, economic and social context. The novelist has tried to reconstruct the broken society and has thus shown social consciousness towards it. The Assamese village life is not a happy one, Injustice, cheating, deceiving all these evils make the people of the bewildered. There have been clearly portrayed in Ashirbador Rang by Arun Sarma. In his novels the portrayal of the love relations among men and women is specially drawn. Again the language of the novelist

is also marked by a poetic prose. “Monsure bhabile... eya sapon mati, mati aru mati, kebal mati. kuroigurir saporit aidore rasal saruwa mati aneye pari thoka drishyato ata jibanta saponar drishya”.<sup>1</sup> (Arun sarma: Ashirbador Rang, p-9)

#### **Arun Sarma’s Ashirbador Rang:**

Published in 1996, Ashirbador Rang is large in volume as compared to his other novels. Before its publication, it has been appearing in a serialised form from 1994 to 1995 in the Assamese magazine ‘prantik’. It has also been broadcasted in the novel reading programme of Akashbani Guwahati Radio Centre. In 1998 Arun Sarma had won Sahitya Academy Award for his ‘Ashirbador Rang. After receiving the award he said, -

“This is a recognition of my writing practice in plays. I have written novels amidst writing some plays and so this is a credit of Assamese Dramatic literature a recognition of playwright:2 (Ranjan Bhattacharjya: Arun Sarma natak samikhyatmak bislekhan, p-26)

The Sahitya Academy award has also established Arun Sarma as a novelist. Besides becoming a successful modern playwright of Radio and stage, he attained maturity as a dramatist in writing novels with ‘Ashirbador Rang.’ And also, this novel has become one of the best novels in the current situation.

Migration is the main problem of Assamese life and its structure. The novel gives a glimpse of the migration of people from former Bengal and Nepal through Brahmaputra during the British rule in India. At the start of the novel it describes: “ 1935 sonar july mahor majnisha. Brahmaputrar bukut misimi jahaj. Mansur Ali bhar toponit.”<sup>3</sup> (Arun Sarma : Ashirbador Rang, p1)

Along with this, there is a clue to the British Teagarden Manager’s life story and their native co-operative landlords, tehsil relationships and their exploitation and receiving of the village people. The exploitation of the people in Assamese life or village life is a common picture for us all. The novel depicts how the common people are drowned on the decades of limitless Samanta systems exploitation and rule. As soon as the advent of British in Assam, the Samanta exploitation system of Ahom ended and tehsil, landlords, land owners etc. took the place to exploit the people in equal level as earlier. The growth of the exploitation of the people by the group is shown to have started with ‘Khargi Mahajan’ in the novel and all the injustices, evil deeds are done continually from their time. The main character of the novel Gajen protests against these injustices in society.

Gajen is a man of an honest mind with a taste of high culture; The common people like Gajen took part in the independence movement of India and had to face the oppression of the British atrocious police. But after the independence, the fruits of success were enjoyed by opponent Khargi Mauzadar and his peers. When Gajen sees Khargi Mauzadar as the president of the first meeting of Independence day, he doesn’t participate in the flag hoisting

program. Instead, he hoists a flag in the yard of his house with his grandmother. When the grandmother asks him to go to the program he says that he cannot tolerate the faces of Khargi Mauzadar and the team of Jadav Bora when the flag will first fly on the sky which will be a nice sight of beauty and respect. The president is the Mauzadar himself the very person who exploited the people and who licks the feet of the British Government.

In this way Gajen forwards his courageous and rebellious mind through the described events of the novel. He alone protests against the injustices. Konlora and Rupai love Gajen but for the fear of the miscreants they cannot co-operate with Gajen. Through Sarbai Pandit and Dharamkanta Kobiraj also sense the innocent mind of Gajen along with his good intentions, Yet they don't dare to give voice against Mauzadar. As the representative of the middle class people, they are actually influenced by the perplexed middle class sentiments. In the real sense because of these peoples negative mentality that society cannot go forward in the tract of progress. The public pond at Gandhaipukhuri is seized by Mauzadar and Gajen protests against it but is unsuccessful. Gajen's father Haladhar is also unsuccessful in fighting in favour of justice and honesty. When went to protest against the oppressor, Haladhar and Gajen both of Sonaruchuk both have to suffer extreme tortures. But Gajen is not a person who accepts his defeat easily. The independance of India couldn't bring any change to life of the people. Instead, the pride, ignorance of common people and their exploitation have shown themselves at its height. Communal violence thus spread all over the nation. The exploiting class conspires against the muslim in Kuroiguri Saponi, and shows violence of Hinduism. But the labour society of Kuroiguri. Who doesn't get persuaded by the conspiracy of the Pakistani Islamist group takes a good decision to leave the meeting arranged by the Terrorists halfway and try to prevent their scam, "why will we go if Pakistan is created? will we get the some proportion of land there? will the same harvest be there? How much labour we have done to get this land arranged we have made houses, have cultivated here, have enjoyed together in the Puja celebrated or festivals, have enjoyed Bihu etc. How will we leave this place"?

Gajen controles there easygoing muslims, who took Assam as their own place, thus - "Though the Islamist group have infused suspicion on your minds yet I can say - at least you people have no prospect of danger here. We will not allow anything to happen to you. Be sure about it."

But Gajen's determind and high ideas involving promise couldn't be fulfilled. The dream of owning Assam as own land on the part of the people like Monsur couldn't become a reality. The oppressive group of Khargi Mauzadar and Jadav Bora burnt the houses in Kuroiguri to ensure their death so that they could acquire the land of the village. They tried to withdraw the people from Kuroiguri Saponi. Monsure Ali had intimate relationship with Gajen. Gajen gifted a small tri-colour to the daughter of Monsur Ali named

Hasina. Hasina affectionately hung the flag on the walls of her house. After the fire, there were only, a book *Burhi Air Sadhu*, two school books gifted by Gajen to Hasina, and also a copy book where there was written, "Gajen Keot only cathe fish with fish hooks." These were found in the burnt box of the house. For Gajen this was very pitiable and hard-to-digest type of a sight. Only Hasina survived as a witness to the tragedy of Kuroiguri. To protect the honeless insecure Hasina Gajen converts himself to a Muslim taking the name Abdul Goni. Before converting into a Muslim however Gajen approached the temple priest 'Bapudeu' and the erudite person in sastras, Dharamkanta Kabiraj if he could marry Hasina and transform her to a Hindu. But the two orthodox persons said, "There is no rule to convert people from other religion to Hindu. No one can convert to a Hindu. A Hindu can convert himself to muslim or a christian but a muslim or a christian cannot become a Hindu, or the Hindu sastras and rituals do not permit such a case."

Gajen couldn't go against the religions oppression prevalent in the rural society because he had known very well how terrible the consequence might be. But it is endearing as well as imitating to see how liberal and noble human ideas does his grandmother hold though she was born in the rural life of superstition and caste discriminations. She accepts a muslim girl as her daughter in law only for humanity and motherly love ignoring all the discriminations of caste and race. But as she couldn't avoid her society so she prevented Hasina to seek and asked her to stay at a separate house. Through the act of her grandchild saddened her a lot, she couldn't ask Gajen to go away from her life. Therefore Gajen stayed in the land of Monsur to protect his grandmother's honour as she was declared outlaws from the society. In his absence, Gajen managed Bhodoram, a cousin to stay with her to look after her. When the grandchild decided to go away she was hurt a lot. When Gajen was about to leave, the grandmother applied vermilion on Hasina's head with her own hands and drawn a big spot on her forehead. And from her waist band she gave Hasina a small pack of clothes.

Through his marriage with Hasina Gajen has proved his reforming personality. Before his marriage there are description of another three marriages in the novel. The marriage of the son of Gorgoram Mauzadar with a girl of poor family, Chandraprabha is one of them. This marriage shows the hollowness of the sophisticated life of the Mauzadar. The second marriage is the marriage of Jaba, the daughter of the priest, 'Bapudeu' of the 'than' a holy place. The marriage was arranged with an old man only for protecting the religion and ensuring peace, and to continue the rule of the marriage of a brahmin girl. But Jaba's husband died a few months ago, after she had suffered a life of causes and suppression for the last few years.

After she returns to her father's home, her marriage is again arranged with Madan. Madan showed a liberal and reforming mind by getting married to Jaba and being rebellious against cruel rituals of Hindu religion. This is

actually the good result of his active participation in the independence movement. The novelist has contrasted the stable inhuman old rituals and cultures of the time with the open and free human mind, and thus has posed a rebellion against it.

Ashirbador Rang has placidly reflected the continuous exploitation, suppression and injustice meted out to the common people in the villages. He has believed that there is no lack of a resistant voice against the social system based on deep seated injustices and there will be someone to support the single protest of Gajen. The hope of Gojen is, "He and Hasina will bring up a root in Kuroiguri. There will be again a Gojen like him. He will speak up for his rights. He has been alone in this path, gave voice to his right all by himself but now onwards he will have a comrade. They together will fight. Once they can become two that will be enough. Hasina is going to gift Gojen the friend in his fight,"

Gajen thus fought for ideal his whole life. But as he was alone he couldn't bring any reform to the society. The group of Khargi Mauzadar and murder Jadav Bora don't get punishment for mass murder case; instead Gajen had to suffer the torture of police for trying to resist the team's devilish activities. They were trying to find out the real culprit and Gajen was killed for preventing the group of the Mauzadar in their path in front of the temple of the Goddess. After Gajen's death, Hasina gave birth to a son. Her son Rahim has the courage to protest against injustice, indignations in society. So Hasina thinks, the miscreants couldn't kill Gojen. He didn't die. He became Rahim Keot.

The characterisation of the novel reveals that all the major and good characters have failed in the struggle of life, have been neglected by fate and have eaten the fruits of their own acts. Every character has been deprived of what they deserve. Gajen has lost his life fighting courageously against the corrupt exploiting class of people. The epitome of motherly love, Gajen's grandmother, Haladhar Hasina, Sarbai Pundit etc. think of the good of the society. All these personalities of the novel in the last Judgement have only prayed for the peace within their own pure souls.

#### **Conclusion :**

Al most a half decades of life history of Assamese village life has been described in Ashirbador Rang. The novelist has created some rebellious character to protest against the ongoing exploitation in society. The characters automatically do their resistant activities. Jaba silently protests against religions oppression and injustice, Gajen's lifelong struggle was a struggle to establish humanity over religion, community, caste, race etc.

To be a real human being one has to involve himself in the welfare of the people and keep his own interests aside. He may be rejected by the outside world but peace will reside in his pure reforming soul. This is what is declared by the novel 'Ashirbador Rang.' The novelist has been successful in showing the rejection of an oppressive society and acceptance of the act. of intellect

and also in creating a good and great literature.

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## **Post-colonial Narration of the Past: Amar Chitra Katha and the Plan of Indian 'History'-Telling**

\* Anirban Guha Thakurta

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*Abstract- Amar Chitra Katha, defined by its producers often as 'route' to our 'roots', appeared in 1967 and continued as the face of Indian Comics for decades, is less critically examined if we only concentrate on its illustrative aesthetics and art of story-telling. A scrutiny into the historicity of the texts in question and the act of treating them as history provides us with a surprising case of assimilation of the ancient Indian tradition of itihasa and the more widely accepted western outlook on scientific history in the context of postcolonial Indian society. Amar Chitra Katha indeed juxtaposes two binary positions and intellectual discourses involving the way to negotiate with past and the concept of periodic time in general. The paper is an attempt to investigate the patterns of history and historical sense, and the act of postcolonial appropriation and assimilation of the native and foreign intellectual and cultural resources, rearrangement of fact and fiction, mythical and rational, the act of 'writing back' against the intellectual hegemonic code available in the imperial delineation of India available in Amar Chitra Katha, and native historiography, and the hybrid space of utterance that it engages with.*

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**Key Words- History, Itihasa, Postcolonial, Comics, Native Historiography, Indian Historiography.**

Comics in India perhaps are/is yet to be considered an academic subject worthy of critical attention. While the history of Indian Comics Industry has provided legendary practitioners, brands, and excessively popular story-tellers and illustrators over the years, comics is hardly considered a serious work of literature. With such lack of critical attention it is not surprising at all that not a huge amount of academic research is done on these literatures and not much academic deliberation is made to pursue the historical significance and historicity of such texts in question. However, in recent years with the rise of greater focus on cultural studies comics in India has gained greater space in the academia. Researchers have gone on to scrutinize the cultural, literary, and historical value of the texts in questions, and have shown interest in distilling the ideological and discursive patterns of such texts.

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\* Assistant Professor, Department of English, Serampore College, Hooghly, West Bengal



Though pictorial narrative traditions, the tropes of story-telling through illustrations have existed in various forms and cultures across India for ages in the form of Pata-chitra, Nakshi-katha (tales in embroidery), Phad, and though even the early paintings in Bhimbetka, sculptures of Ajanta and Ellora narrating various *Jataka* tales and *Puranas* are considered relevant predecessors of the comics in India, it is undeniable that Comics in the ‘modern’ and familiar sense of the term grew in India under British guidance where often the foreign masters brought their own cultural element, and the Indians followed the norms and narratives that were largely foreign. Indian comics until the beginning and growth of *Amar Chitra Katha* in 1967 was either translations of the already existing genres in Europe, America, China, and Japan, or were re-projections of the already established western superheroes as represented in early *Indrajal Comics* published by Bennett, Coleman and Co. *Amar Chitra Katha*, under the guidance of Anant Pai, became a tool of narrating India, with a complete devoted focus on indigenous myths, heroes, tales, and historical figures, since Pai thought it was necessary to educate the children on the history and culture of their nation. What seemed to be an aesthetic enterprise turns out to be a form of literary historiography, and the present paper is based on two seminal points of investigation: firstly, what might have been the reasons that drove *Amar Chitra Katha* to Indian history-telling; and secondly, how wholly, validly, or purely that historical knowledge was disseminated in the context of postcoloniality and nationalism.

Lack of what is called ‘history’ as well as ‘historical sense’ has been a throbbing issue in India. Quoting V.S. Apte’s *Sanskrit-English Dictionary* (1912) E. Sreedharan provides the standard definition of *itihasa*:

*Itihasa* means ‘verily, thus it happened’...

*Dharmarthakamamokshanam upadesasamanvitam*

*Purvavrttam kathayuktam itihasa prachakshate.*

(What is known as *itihasa* is past events or ancient lore arranged in form of stories in which duty or moral law, worldly well-being, desire, love and sex, and final deliverance or communion with god, find instructive application)<sup>1</sup>

Undoubtedly, for Sreedharan this concept of *Itihasa* as well as *Purana* (meaning ancient lore) seems inadequate to qualify for ‘history’ in the scientific and objective sense of the term. R.C. Majumdar too notes that:

One of the gravest defects of Indian culture, which defy rational explanation, is the aversion of Indians to writing history. They applied themselves to all conceivable branches of literature and excelled in many of them, but they never seriously took to the writing of history.... Rudiments of history are indeed preserved in the Puranas and the Epics. We find lists of kings and sometimes, though very rarely, their achievements, but it is impossible to arrange them in chronological order without extraneous help.<sup>2</sup> This lack of historical sense or aversion towards composition of history

following chronological order of ancient India has been a subject of great scholarly scrutiny. To Vincent Smith:

Most of the Sanskrit works were composed by Brahmans, who certainly had not a taste for writing histories, their interests being engaged in other pursuits.<sup>3</sup> (cited by Sreedharan)

Historians like A.B. Keith believe that lack of national feeling that might have spurred the writing of history remained absent in ancient India. Investigations on whether such explanations are valid and satisfactory are not part of our present concerns. However, the fact lies that the only one historical work, following the standards of historical sense, that can be called history in ancient India is Kalhana's *Rajtarangini* (AD 12<sup>th</sup> Century). The Sultanate Period and the Mughal Period saw a larger growth in writing of histories. 'The Muslims, like the Christians, had a keener sense of history and a more precise sense of chronology.... Some of them wrote general or universal histories of the world until gradually a regional and domestic sense emerged'.<sup>4</sup> With the rise of British imperialism, India under Britain saw a considerable amount of growth in matters related to history writing. The process of Orientalist or Indological recovery of ancient Indian History began, and was patronised by even the British masters like Warren Hastings. However, with the same came the imperialist defamation of Indian past following the discursive patterns of political knowledge formation and appropriation which resulted out of the hegemonic code of colonial governance. James Mill, an official of the East India Company, who according to Sreedharan thought that 'Indian culture was static and degraded'<sup>5</sup> and who asserted that the laws and institutions of the Hindus could have not begun 'under any other than one of the rudest and weakest states of the human mind'<sup>6</sup> happened to be the first important composer of history of India. And such dissemination of knowledge that justifies the doctrine of 'white man's burden' and legitimises colonial violence, becomes also for the imperial authority a tool to hegemonize native psyche and identity, subvert and mummify their history. With the rise of the anti-colonial nationalist movement, the spread of nationalism that seemed to be lacking in the ancient Indian society, came also the vogue of nationalist histories that posed a counter discourse opposed to the imperial design. Nativism and glorification of indigenous past became regular tools in composition of history. Lack of history and historical sense was now attacked by nationalist writers and thinkers. In *Bibidha Prabandha*, Bankim Chandra Chatterjee famously wrote:

There is no Hindu history. Who will praise our noble qualities if we do not praise them ourselves?.... When has the glory of any nation ever been proclaimed by another nation? .... The Hindus have no such glorious qualities simply because there is no written history.<sup>7</sup> (Cited by Sreedharan)

This bankruptcy was soon to be replaced by abundance of histories of India in the first decades of the Twentieth Century and the vogue in patriotic and

nationalist light continued even after political decolonisation. Historical novels as well as literature with a greater chronological sense and sense of history emerged, and continues to emerge, and comics in India too perhaps had to respond to the call of not merely telling about the past, but reconstructing and rewriting history and national identity. Perhaps *Amar Chitra Katha* was designed in many cases as a celebration of the Indian culture and past, a necessary equipment in the postcolonial context of ‘writing back’.

When Pai began with *Amar Chitra Katha* he had two very problematic points to tackle with in his endeavour to Indianize the foreign form of comics. One, he had to be more of a story-teller, the absentee figure in the newly developed urban nuclear families which lacked the grandfatherly or grandmotherly figure who used to narrate stories before the children. He needed to be a familiar figure like ‘uncle Pai’. Secondly, he had the task of redirecting the audience’s attention to Indian tales and histories, provide the reader the ‘route’ to their ‘roots’ to counter the already established intellectual hegemony operationalized by the British rulers. Karline McLain cites Anant Pai’s own experiences in February, 1967 in his own words in this context:...the program was a quiz contest featuring five students from St. Stephen’s College. When they were asked, the students could not name the mother of Lord Ram. I was disappointed, but I thought, well that is from a long time ago. But then a question came about Greek gods on Mt. Olympus, and the children could answer that question! This is the trouble with our education system: children are getting alienated from their own culture.<sup>8</sup>

Quite significantly, one has to view Pai’s attempt at narrating Indian past — sometimes mythical, quasi-religious, and ‘ahistorical’ than being purely and objectively ‘historical’ — as a way of filling up the vacuum that was left in the field of popular knowledge and culture. From 1967 the first featuring titles were mostly dealing with Hindu Gods and Goddesses, mystical stories, Miracles, and so on, beginning with Krishna. It was only later that issues on great rulers of India Harsha, Asoka, Chandragupta Maurya, Rana Pratap, Babur, Akbar, Sher Shah, Shah Jahan were published. Freedom fighters like Rani Laxmi Bai, Mangal Pandey, Bhagat Singh, Gandhi also featured in later as part of the nationalist historiographical plan of celebrating native past. With the passage of time, the newly developed cosmopolitan flair of urban India was matched with titles like that of Kalpana Chawla. While the American comics grew in the Golden Age with popularization of the Super Hero motif, in *Amar Chitra Katha* even Gods were humanized, illustrated in the manner of calendar art, having been greatly influenced by Raja Ravi Verma who was perhaps the first in India to be able to Romanize and humanize the divinity in the realm of visual aesthetics.

Having now already discussed the first query regarding what might have prompted Pai to have come up with his own plan of telling Indian histories in the post-colonial context in *Amar Chitra Katha*, when we begin with the

second query, we often encounter certain relevant questions regarding historical sense and perspective available in *Amar Chitra Katha*, the dominant ideology established in the narratives, and the art of historiography itself. Firstly, how can the stories related to Indian gods and goddesses be linked with the plan of history-telling? Secondly, how wholistic or restrictive was the Indian history narrated in the world of *Amar Chitra Katha*? Thirdly, can we at all bridge the gap between the need to attain objective historical sense in the writing of history and the moralistic tone required in the stories when they have children as audience? Fourthly, is there any controversy related to the politics of inclusion and exclusion in handling historical records? Fifthly, is the history narrated and the historical sense operational and identified just, pure, and proper?

**Sreedharan writes:**

... for any piece of writing to be treated as history *per se*, R. G. Collingwood prescribes four tests: First, it must partake of the character of *science*.... Second, it must be *humanistic*, i.e., it should be about man, about actions of human beings in the past. Third, as science it should have an *inquiry procedure*. And, last, it must have a *purpose*, and the purpose of history is *human self-knowledge*, man's knowledge about man.<sup>9</sup>

In the Indian context the concept of *itihasa* categorically states that its object is to instruct man in the attainment of the *purusharthas* (the ends of life as concerned in Hindu philosophy — *dharma, artha, kama* and *moksha*).<sup>10</sup> Moreover, it would be improper to hierarchize the branches of human knowledge and belief system by favouring 'scientific' as the only valid way of analysing the past. Ancient Indian society believed that there was hardly any possibility of progressive movement with the passage of time from one *yuga* to another. In fact the belief was that the human society follows a declining pattern and suffers a continuous fall from the stage of excellence to that of extreme degeneration in the *Kali yuga*.

Now to answer the questions already posed we can argue that while the concept of *itihasa* in the ancient Indian society is often unhistorical and lacks intellectual objectivity, and often rationality, the concept itself, with its focus on two seminal points — it being 'past events or ancient lore arranged in form of stories' and in which moralising and moral lessons find 'instructive application' — enables Pai to bridge the gap between objective historiography and delightful teaching and moralising tone required to educate the children. Pai was catering to the demands of the infant mind, and had to celebrate the ideal form of life. In many of the character sketches — both mythical and historical — Pai attempted to blend the Western concept of linear progressive history and the ancient Indian tradition of *Vamsa* and *Charita* which would uncomplicatedly celebrate a character in a non-dubious, unilateral, and one-dimensional way. Moreover, we cannot dismiss issues on Krishna or Pandavas as unhistorical facts. The historicity and historical value

of such narratives is already in the academic domain. Moreover, the ancient Indian concept of attempting to view *itihasa* as a way to instruct man to attain *purusharthas* could only have been possible by trying to view such characters like Krishna as an ideal figure. While mythical figures and their miraculous deeds might seem unscientific and unhistorical in this regard, Pai manages to retain a scientific method in narrating such tales, with a deft and subtle handling of the visual imagery:

With mythology so many things that we read don't seem natural and possible.... You know the story of how Krishna lifts the Govardhan Mountain on his one finger? Well, is this possible? Scientifically it is not. So I didn't show this, there was no image of Krishna lifting the mountain. Instead, I just had people talking about it, saying, "look, Krishna has lifted the mountain to shelter us." That way I didn't show something unscientific, but didn't completely ignore this episode in the story either.<sup>11</sup> (cited by Karline McLain)

Pai was able to achieve three aims at a time with a unique historical sense. The mythical figure is understood both as a greater man and a deity in the same frame, subscribing to the requirement of the western idea of being 'scientific' and the ancient Indian concept that in earlier *yuga* which was a better time than the present such a miracle was not utterly improbable. Moreover, Pai manages to place an Indian form of 'superhero' capable of heroic deeds, and thereby counters the western superheroes in the comics industry. And lastly, by insisting upon both the scientific and the miraculous at the same time he is catering to the needs of the infant comics book reader who demands entertainment through amazement and rational development at the same time. The scientific and the concept of *purusharthas* get blended, and this aspect forms a hybrid space of utterance in the post-colonial context. Pai also manages to reconfigure the idea of moralistic instructive application embedded in the concept of *itihasa* by looking at the mythical stories like the churning of ocean in a symbolic order which attempts to provide a scientific view of life and past to delightfully instruct the infants:

The Ocean of Milk, it is churned in search of nectar, but first poison comes out, not the nectar. This is symbolic. It means that daring to doubt your faith brings you uncertainty and unhappiness also. This is the poison. But if you keep churning, then all your doubts eventually become clear, and you receive the *amrit* — the nectar — finally.<sup>12</sup> (cited by Karline McLain)

Thus, even Pai's selection of mythical events and characters bear a sense of history, only if we allow ourselves to view them in the post-colonial context of search for native cultural roots and the constant thrust on dealing with the legends of the past and appropriating them in the modern context. In dealing with the historical figures, especially the issues on Indian freedom fighters like Rani Laxmi Bai, Gandhi, Bhagat Singh, Mangal Pandey, and others Pai counters the imperial ideology and follows nationalist paradigms of glorifying native past. The historical sense discernable in such narratives is

closer to western outlook in their sense of chronology and linearity, but even here Pai manages to fetch patterns of *Charita* or Ornate Biographies in ancient Indian historical documentation. The imperial concept of barbaric past is countered and dismissed by celebration of great and dynamic rulers of India, like Harsha, Chandragupta Maurya, Asoka, Sher Shah, Akbar, and so on. One might argue that the multifacetedness of the individuals in question is neglected, and thereby historical objectivity is neglected. However, we can argue that Pai follows the patterns of glorification of native past in the postcolonial context in one hand, and adhering to the *Charita* tradition on the other. Sometimes, the concept of continual degradation of human beings with the passage of *yugas* is dismissed, since in such issues about Indian social reformers like Vidyasagar, the social evils and the restrictive hegemonic code available in the native society is uncompromisingly countered, and there is celebration of progress in the human society.

It has been definitely a point of controversy when we try to judge the purity and validity of the narratives and historical data available in *Amar Chitra Katha*. There had been indeed greater focus on the Hindu and Non-Muslim rulers; only such Muslim rulers who happened to be ‘liberal’ are granted space; women are often described self sacrificial and masculinity often appears to be justified; regional histories find lesser space. However, these don’t wholly darken the spirit of nationalism and the urge to be pan-Indian does not get defeated. Controversial historical personages and happenings are eliminated perhaps to cater to the needs of the infant mind. One must not ignore the fact that *Amar Chitra Katha* has to be first understood as a branch of children literature. Adult consumption and critical scrutiny often doubts the authenticity and validity of historical records available in *Amar Chitra Katha* and often questions the politics of arrangement of fact and fiction, the ideology behind the composition of such narratives. This is not a negligible issue either. For example, Shah Jahan in *Amar Chitra Katha* appears more as a lover than a ruler, and Ranapratap, fighting the Mughals appears to be Patriotic, while on the other hand Akbar seems in the other issue an ideal ruler; both Pulakeshi and Harsha in separate issues are celebrated adequately. India is a nation having many nations within it. A subcontinent, with diversity as the uniqueness that defines India, could perhaps best be depicted in such a manner. In *Amar Chitra Katha* there is definitely India’s history and the historical methodology applied is a unique case of elaborating and reconfiguring native ideas on *itihasa* blended with the western concept of history. Perhaps this juxtaposition is indicative of the inevitable fact of postcoloniality of the Indian society — a continuous coexistence of drive towards the modern and global, and a search for identity in native cultural roots.

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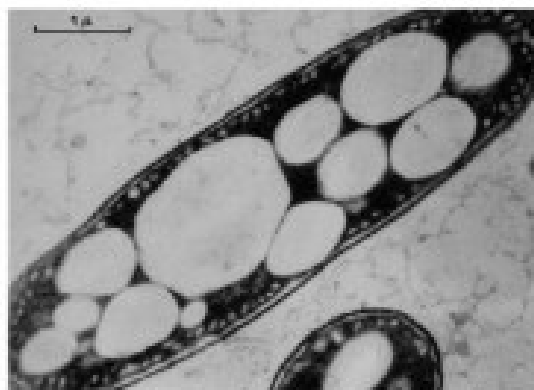
## PHA as a polymer of bio-degradable plastics-A Review

\* Jasmine Chetia

***Abstract-** Within just a few decades since mass production of plastic products commenced in the 1950s, plastic debris has accumulated in terrestrial environments, in the open ocean, on shorelines of even the most remote islands and in the deep sea (Madhuri Girdhar, 2014). Mega- and macro-plastics have accumulated in the highest densities in the Northern Hemisphere, adjacent to urban centres, in enclosed seas and at water convergences (fronts). The longevity of plastic is estimated to be hundreds to thousands of years, but is likely to be far longer in deep sea and non-surface polar environments. Plastic debris poses considerable threat by choking and starving wildlife, distributing non-native and potentially harmful organisms, absorbing toxic chemicals and degrading to micro-plastics that may subsequently be ingested. Poly- $\alpha$ -alkanoates (PHA) has proving itself as an advance polymeric material as well as an alternative for plastic material.*

**Key Words-** Plastic products, Environment, Urban centres

Although bioplastics have been proposed for several decades to replace the petroleum-based plastics due to their less dependence on fossil fuels and environmental impact, no general agreed definition of concept of bioplastics is available. Some bioplastics are non-biodegradable while others like starch plastics, cellulose polymers are. Sometimes extra additives may be added to these bioplastics to improve their stability and functionality. These additives may be neither biodegradable nor derived from renewable resources. The third type of bioplastics is polyhydroxyalkanoates (PHA) which are directly produced by microorganisms (Nutti et al., 1972). They are made from 100% renewable resources without additives



Transmission electron micrograph of ultrathin section of *Azotobacter chroococcum* cell treated with phenylacetic acid. From Nutti et al. 1972

\* Assistant Professor (Contractual), Department of Botany, Sonari College



and fully biodegradable, enabling a so-called bio-based-to-biodegradable (or cradle-to-cradle) life cycle. Therefore, PHA can be considered as the only fully bio-based and biodegradable plastic.

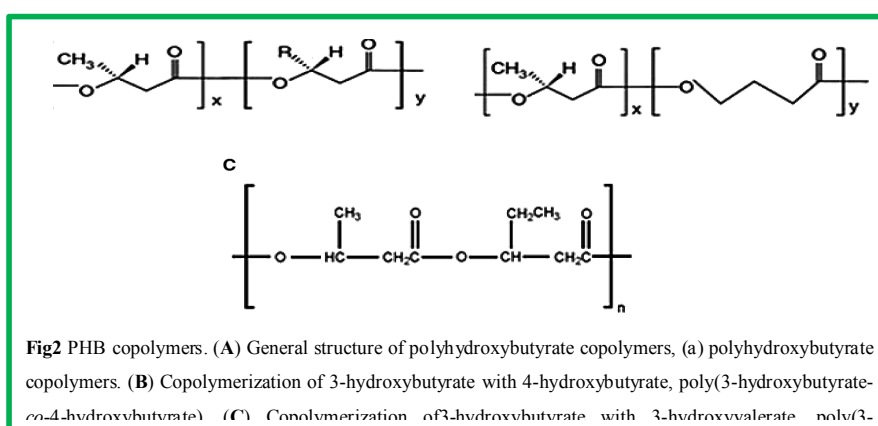
**Polyhydroxyalkanoates:**

Polyhydroxyalkanoates (PHA) is a family of naturally occurring, linear, aliphatic polymers with diverse structures produced by more than 75 genera of gram-positive and gram-negative bacteria biopolymers with diverse structures. Since it was firstly discovered in *Bacillus megaterium* (Lemoigne, 1926), myriad types of bacteria in soil, activated sludge, oceans and extreme environments have been reported to be capable of synthesizing PHA (Steinbuchel and Valentin, 1995). Although PHA were found associated many different types of ecological functions, such as sporulation and germination, exopolysaccharide production and endurance under environmental stress, the most general accepted function of PHA is the intracellular storage compounds as carbon and energy source. PHAs are produced by microbial fermentation of carbon-rich substrates (sugars, lipids, and their derivatives, respectively) in an environment of low oxygen concentration and limited supply of essential nutrients such as phosphorous, nitrogen, sulphur, magnesium, etc. Under such stringent conditions, the carbon sources are assimilated, converted into hydroxyalkanoates (HA), and finally polymerized into high molecular weight compounds. The microbes accumulate PHA as water insoluble, granular, intracellular inclusions in the cytoplasm, forming about 90% of the total cellular weight. The molecular mass of PHA ranges from 50,000 to 1,000,000 Da depending upon the conditions and microorganisms in which they are produced (Madison and Huisman, 1999). PHA is an excellent storage compound because of its presence in the cytoplasm, even in large quantities, it does not disturb the osmotic pressure of the cell. PHAs are viewed under a transmission electron microscope, the granules appear as electron transparent, discrete, spherical particles with clear boundaries. PHA granules can also be stained with Sudan Black B and more specifically by Nile blue A exhibiting a strong orange fluorescence.

PHA can be classified as short, medium, or long chain length PHAs. PHAs created from 3–5 C atoms are called short-chain-length (SCL) PHAs with 6–14 C atoms are called medium-chain-length (MCL) PHAs. If the monomeric unit of PHA has more than 14 C atoms, then the polymer belongs to the class of long-chain-length (LCL) PHAs. The classification of the PHA copolymers is based on the number of C atoms in their monomeric unit's composition but at the same time it reflects the different physical properties of SCL, MCL, and LCL PHAs. SCL PHAs are solid or semisolid while MCL PHAs are latex like, rubber or elastomeric in nature. The rubber or latex-like PHA (MCL) also differs from the PHA (SCL) with respect to the melting temperature and the extension at the break point, melting point, glass transition temperature, crystallinity, etc., depend on the length of the side

chains of the

The most extensively studied PHA is PHB. Bacterially produced PHB has sufficiently high molecular weight to have polymer characteristics that are similar to conventional plastics (Madison and Huisman, 1999), behaving as a thermoplastic with its mechanical and physical properties resembling that of plastics like polypropylene. The second most extensively studied polyhydroxyalkanoate is polyhydroxyvalerate (PHV). Poly(3-hydroxybutyrate-co-4-hydroxybutyrate) also known as P(3HB-co-4HB) and Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) also known as P(3HB-co-3HV) have lower crystallinity and increased elasticity in comparison to P(3HB) (Sudesh, 2012). Figure 2 gives the chemical structures of PHB copolymers.



**Fig-2** PHB copolymers. (A) General structure of polyhydroxybutyrate copolymers, (a) polyhydroxybutyrate copolymers. (B) Copolymerization of 3-hydroxybutyrate with 4-hydroxybutyrate, poly(3-hydroxybutyrate-co-4-hydroxybutyrate). (C) Copolymerization of 3-hydroxybutyrate with 3-hydroxyvalerate, poly(3-hydroxybutyrate-co-4-hydroxyvalerate)

The key polymerase enzyme involved in PHA biosynthesis is PHA synthase. The classification of polyester synthases according to Rehm et al.; (Rehm, 2007) is as follows.

#### Class I/Class II:

These two classes of polyester synthases comprise of enzymes consisting of only one type of subunit (PhaC) with MW between 61 and 73 kDa (Qi et al., 1997). Class I polyester synthases (*R. eutropha*) preferentially utilize CoA thioesters of various (*R*)-3-hydroxy fatty acids comprising 3–5 carbon atoms as its substrate both in vivo and in vitro, whereas class II polyester synthases (*P. aeruginosa*) preferentially utilize CoA thioester of various (*R*)-3-hydroxy fatty acids comprising of 6–14 carbon atoms as its substrate (Rehm, 2007, Ren et al., 2000).

#### Class III:

These polyester synthases (derived from *Allochromatium vinosum*)

comprise of enzymes consisting of two different types of subunits: 1) the PhaC subunit (MW of about 40 kDa) exhibiting amino acid sequence similarity from 21–28% to class I and II polyester synthases; and 2) the PhaE subunit (MW of about 40 kDa) with no similarity to polyester synthases. These polyester synthases prefer CoA thioesters of (*R*)-3-hydroxy fatty acids comprising of 3–5 carbon atoms (Liebergesell et al., 1992, Liebergesell and Steinbuchel, 1992).

#### Class IV:

These polyester synthases (*Bacillus megaterium*) are similar to the class III polyester synthases, whereas the subunit where the subunit PhaE is replaced by PhaR (of about 20 kDa) (McCool and Cannon, 1999, McCool and Cannon, 2001). The *T. pfennigii* polyester synthase exerts a broad substrate specificity comprising CoA thioesters of short-chain-length (3–5 carbon atoms) as well as medium chain-length (6–14 carbon atoms) 3-hydroxy fatty acids. *A. punctata* synthase catalyzes the synthesis of a copolyester of 3-hydroxybutyrate and 3-hydroxyhexanoate. PhaE is replaced by PhaR (of about 20 kDa).





Class	Subunits	Species	Substrate
I	 ~60-73 kDa	<i>Ralstonia eutropha</i>	3HA <sub>nC1</sub> -CoA (-C3-C5) 4HA <sub>nC2</sub> -CoA, 5HA <sub>nC3</sub> -CoA, 3MA <sub>nC1</sub> -CoA
II	 ~60-65 kDa	<i>Pseudomonas aeruginosa</i>	3HA <sub>nC1</sub> -CoA (-C5)
III	 ~40 kDa    ~40 kDa	<i>Allochromatium vinosum</i>	3HA <sub>nC1</sub> -CoA (3HA <sub>nC1</sub> -CoA [-C6-C8], 4HA-CoA, 5HA-CoA)
IV	 ~40 kDa    ~22 kDa	<i>Bacillus megaterium</i>	3HA <sub>nC1</sub> -CoA

Fig 3: The subunits and substrate affinity of four classes for PHA synthase.  
[http://mibi1.uni-muenster.de/Biologie.IMMB/Biologie.IMMB.Steinbuechel/en/Forschung/PHA.html#PHA\\_Synthases](http://mibi1.uni-muenster.de/Biologie.IMMB/Biologie.IMMB.Steinbuechel/en/Forschung/PHA.html#PHA_Synthases)

#### Microbial synthesis of PHA:

Large scale economical production of polyhydroxybutyrate (PHB) depends upon optimization and selection of high PHA producing strain (Madhuri Girdhar, 2014). Since the discovery of PHA more than 90 genera of archae and eubacteria (gram positive and gram negative) have been detected in aerobic and anaerobic habitats able to produce PHA.

Verlinden *et al* have illustrated about the production of biodegradable polyhydroxyalkanoate from bacteria (Verlinden et al., 2007). Liu *et al.*; isolated

two novel strains of gram positive bacteria capable of accumulating poly(3-hydroxybutyrate co 3-hydroxyvalerate) from an anaerobic-oxic activated sludge system, fed with acetate which also accumulated acetate or glucose under anaerobic conditions. 16sRNA sequencing revealed that both strains belonged to the gram-positive high-G+C group and accumulated 14.4% (cell dry weight) polyhydroxyalkanoate (Liu et al., 2000). The microbial community composition of polyhydroxyalkanoate producing organisms (PHAAs) was investigated by Oshiki *et al.*; in an aerobic waste water treatment plant using FISH (Fluorescence in situ hybridization) and Nile blue A staining techniques. The dominant members were found to be of the class *Alphaproteobacteria* and *Betaproteobacteria* (Oshiki et al., 2013).

The PHB production by the bacillus strains isolated from soil was found to be growth associated in a study conducted by Aarthi *et al.*; at Mysore. Based on their 16S rRNA gene sequences, the bacteria were identified as *Bacillus mycoides* DFC1, *Bacillus cereus* DC1, *Bacillus cereus* DC2, *Bacillus cereus* DC3 and *Bacillus cereus* DC4. The polymer production by the strains was found to vary from 12.18% to 57.2 % content (w/w) of the dry cell weight (Aarthi, 2011). With an aim to isolate PHA producers, Shamala *et al.*; screened 123 isolates of which 12 isolates were found to be positive. All the isolates were identified to be various strains of *Bacillus* which producing 11-41% of PHA in sucrose containing medium over a growth period of 24-74 hours. An analysis of the polymer using NMR spectroscopy, infrared spectroscopy and gas chromatography indicated that the polymer contained polyhydroxybutyrate and polyhydroxyvalerate (Shamala et al., 2003).

Another study which identified *Bacillus* sp. from soil samples and activated sludge was Thirumala *et al.*; during a study in Hyderabad. When they grew bacteria in E2 basal medium with two different sugars sources they showed varied dry cell weight of PHB. Their optimum growth occurred between 28°-30° C. during which *Bacillus* sp. 871 showed 70.04% (DWC) PHB when carbon source was glucose and 55.5% when the carbon source was lactose and *Bacillus* sp. 112A showed 67.73% of (DWC) PHB when carbon source was glucose and 50.5% (DWC) PHB when carbon source was sucrose. The average mass of the polymers produced by sp.871 was 521kD and 112A was 513kD (Thirumala et al., 2010). Similarly in 2008, Vishnuvardhan *et al.*; screened sewage samples and sludge as a source to isolate bacteria which produce PHA granules. Of the 105 isolates out of which 15 were positive for PHA production with 13 isolates to produce PHB and 2 isolates were producing polyhydroxybutyrate –co-polyhydroxyvalerate (Vishnuvardhan Reddy et al., 2008).

In a bid to understand the role of nutrient limitation and produce PHA using cheap raw material Shamala *et al.*; studied the co-production of polyhydroxyalkanoates (PHA) and  $\alpha$ -amylase by *Bacillus* sp CFR67 using corn starch and other agro-industrial waste as a substrate. Bacterial growth

and polymer production was elevated by supply of hydrolysates of wheat bran and rice bran. In batch culture there was production of Polyhydroxy butyrate co-polyhydroxyvalerate in the ratio 95:5 (Shamala et al., 2012). In a similar approach, Bhattacharya *et al.* reported the production of poly-3-(hydroxybutyrate-co-hydroxyvalerate) by *Haloferax mediterranei* using rice-based ethanol stillage which holds promise for competitive production of PHB using cheap carbon sources in industrial scale (Bhattacharyya et al., 2014). Reddy *et al.*; investigated the influence of substrate load and nutrient concentration (nitrogen and phosphorous) on PHA production using wastewater as substrate and mixed culture as biocatalyst. PHA accumulation was high at higher substrate load [OLR3, 40.3% of dry cell weight (DCW)], low nitrogen (N1, 45.1% DCW) and low phosphorous (P1, 54.2% DCW) conditions. With optimized nutrient conditions production efficiency increased by 14%. (Venkateswar Reddy and Venkata Mohan, 2012). Nutrient stress is an important factor which triggers the accumulation of PHA. For instance in their study Phanse *et al.*; observed that there was more PHB producing bacteria in sewage and activated sludge than soil samples. Out of 23 bacterial strains isolated there was a ratio of 14:9 with respect to sewage soil. (Phanse et al., 2011). Waste from Pulp, Paper, and Cardboard Industry have been also explored as a potential raw material for the production of PHA. Bhuwal *et al.*; in reported the use of cardboard waste water as a cultivation medium for the production of PHB using *Enterococcus sp.* And *Brevundimonas sp.* (Bhuwal et al., 2013). Luhana *et al.*; reported isolation of PHA producing bacteria which accumulate upto 80% of PHA of their total dry cell weight after 48 hours inoculation from paint industry effluents (Luhana K. K., 2013). The effect of chemical oxygen demand (COD)/N ratio on PHB accumulating ability in an anaerobic/aerobic cycle sequential batch reactor was studied by Liu *et al.*. The population of the activated sludge was studied periodically using denaturing gradient gel electrophoresis (DGGE). The predominant strains belonged to five genera: *Bacteroidetes sp.*, *Acinetobacter sp.*, *Betaproteobacteria sp.*, *Gammaproteobacteria sp.* (Liu et al., 2013).

In 2002 Borah *et al.*; studied the effect of environment and nutrition on the growth of PHA in cells on a scaffold based on polyhydroxyalkanoates derivative from mutant strain of *Pseudomonas sp.* In an attempt to enhance PHA quality, naive PHA was blended with biodegradable polymeric materials like polyethylene glycol (PEG), polylactic acid (PLA) etc. to improve the scaffold properties. They reported that PHA: PEG showed better scaffold prepared supports better cell growth than plastic surface (Borah et al., 2002). In a similar effort Shabna *et al.*; evaluated the growth of cells on a scaffold based on polyhydroxyalkanoates derived from the mutant strain of *Pseudomonas sp.* They reported that PHA: PEG showed better scaffolding than other samples. It also stated PHA: PEG scaffold prepared supports better cell growth than plastic surface (Shabna et al., 2013). In 2012 Singha *et al.*;

studied the production of PHA copolymer by *Bacillus thuringiensis*. strain EGU45. They produced the new co-polymers NP along with hydrogen and PHB using synthetic media (Singh et al., 2013).

In a study carried out by Ciesielski *et al.*; performed experiments with microorganisms which were cultured creating microbial consortium towards PHA production. After cultivation of culture the bacterial culture was identified using 16s rRNA gene sequencing approach. The presence of the PHA producing genes were identified using PCR. Out of 11 strains isolated, 4 strains were found to be PHA producing (Ciesielski et al., 2013). Michinaka *et al* in 2007 published the identification of the polyhydroxyalkanoic acid synthase (phaC) gene which encodes PHA synthase involved in the formation of PHA containing 3H2MV in activated sludge process operated in a batch culture. The diversity to produce PHA containing 3H2MV and the diversity of the partial phaC gene were monitored continuously. Analysis of the partial phaC gene was done by PCR followed by cloning and DNA sequencing or by PCR followed by T-RFLP (Michinaka et al., 2007). Solaiman *et al.* in 2000 developed a PCR protocol for the identification of type II PHA synthase genes. The primer-pair, I-179L and I-179R, was based on the highly conserved sequences found in the coding regions of *Pseudomonas* phaC1 and phaC2 genes. The method is especially important for the identification and verification of organisms that harbour mcl-PHA biosynthesis genes (Solaiman et al., 2000). The presence of PHA synthesis genes and PHA granules in the extreme northern Baltic Sea ice and cold pelagic seawater environments. The microscopic evidence for PHA production based on the finding of putative PHA granules was corroborated by the detection of phaC genes (Parnanen et al., 2015). Ribosomal intergenic spacer analysis (RISA) technique was used to analyse dynamics of microbial community capable of converting waste glycerol to polyhydroxyalkanoates (PHA) under cultivation on 5% v.v-1 crude glycerol as a carbon source. 16S rRNA sequences of dominant RISA bands showed bacterial community cultivated in waste glycerol were closely related to *Azoarcus* sp., *Bacillus cereus*, *Bacillus pseudofirmus*, *Flavobacterium columnare* and *Thauera* sp. (Wattanaphon et al., 2011).

In 2010, Shrivastav *et al*, in the Gujarat Coast of India studied PHA production from Cyanobacteria. It was reported that Cyanobacteria can produce biopolymers from carbon dioxide as a sole carbon source and the yield of PHA could be increased by various means such as nutrient limitation, stress conditions being induced etc (Shrivastav et al., 2010).

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## Optimization of Production of Antimicrobial Compounds from Soil Bacteria

\* Jitin Rahul \*\* Anuradha,  
\*\*\* Jagdish, \*\*\*\* Mamoucha Stavroula

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**Abstract-** *As the antibiotics are secondary metabolites, they are synthesized in trace amounts in an ordinary fermentation. Moreover the synthesis of antibiotic is regulated by tight metabolic and genetic regulation. Therefore it is the task to the biotechnologists to modify the wild type strain and to provide cultural conditions to improve the productivity of antibiotics. Improvement of the microbial strain offers the greatest opportunity for cost reduction without significant capital investment. The desired result of strain improvement is the ability of a manufacturing process to meet additional demands without adding more production scale fermenters.*

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**Key Words-** Antibiotics, Antimicrobial compounds, Bacteria, Soil

### Introduction:

Antibiotics are one of the pillars of modern medicine (Ball *et al.*, 2004), but the rate of loss of efficacy of old antibiotics is outstripping their replacement with new ones for many species of pathogenic bacteria (Hancock, 2007). The emergence of antibiotic resistant bacteria is a problem of growing significance in dermatological and surgical wound infections (Colsky *et al.*, 1998; Giacometti *et al.*, 2000). In general, the most important resistance problems in the management of wounds have been observed with *S. aureus* and coagulase-negative staphylococci among the Gram-positive species and with *E. coli*, *Klebsiella pneumoniae* and *P. aeruginosa* among the Gram-negative species (Filius and Gyssens, 2002).

Considerable research is being done in order to find new chemotherapeutic agents isolated from soil (Rondon *et al.*, 2000; Crowe and Olsson, 2001; Courtis *et al.*, 2003). Soil microbial communities are among the most complex, diverse and important assemblages of organisms in the biosphere; and they participate in various biological activities. Accordingly,

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\* Department of Botany, Kalindi College, University of Delhi, New Delhi-110008, India  
\*\* Department of Environmental Science & Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad-826004, Jharkhand, India  
\*\*\* Department of Mine Ventilation, Central Institute of Mining and Fuel Research, Dhanbad-826015, Jharkhand, India  
\*\*\*\* Department of Botany, Faculty of Biology, National and Kapodistrian University of Athens, Athens, Greece

they are an important source for the search of novel antimicrobial agents and molecules with biotechnological importance (Hackl *et al.*, 2004).

Antibiotics include a chemically heterogeneous group of small organic molecules of microbial origin that, at low concentrations, are deleterious to the growth or metabolic activities of other microorganisms. The nineteenth and early twentieth century's saw the discovery and development of many new antibiotics. Most were discovered as doctors and scientists worked to isolate and develop "good" bacteria that could be used in the treatment of infectious diseases. Many different antibiotic substances were discovered and developed. During the nineteenth century, various experiments were done in an attempt to find a magic, powerful antibacterial substance that would rid humankind of the scourge of infection. In 1877, experiments in Paris demonstrated the benefits of using harmless, "good" bacteria to treat pathogenic or harmful bacteria. These experiments did indeed prove that harmless bacteria could be used to compete with pathogens (harmful bacteria), although they did not kill the pathogens.

Also in Paris, Louis Pasteur described the beneficial effects of injecting animals with harmless soil bacteria to combat anthrax. Many other experiments on anthrax and cholera confirmed these findings and proved that harmless bacteria can inhibit the growth of disease-causing bacteria. In Germany in 1888, an antibacterial substance called pyocyanase was isolated. Animal trials of this substance showed it to be very effective. In fact, the results were so exciting that trials were undertaken in humans suffering from a variety of infections. However, the results of the human trials were very disappointing—pyocyanase was found to be too toxic. Consequently, all research on this substance halted.

In 1910, a more promising agent called salvarsan, which was actually a dye, was shown to be effective in the treatment of syphilis, a common sexually transmitted disease at the time. Again, toxicity in humans was a major barrier to its development and widespread use. The problem of toxicity and the failure to find other antimicrobial agents were the two factors hindering the progress of researchers. Enthusiasm began to wane in the search for the "magic bullet" that would rid humanity of infectious diseases, many of which were major causes of death at that time.

The tide began to change when Alexander Fleming discovered penicillin. After distinguishing himself in his medical studies, Dr. Fleming started research work in pathology in 1908. His early work led to the isolation of lysozyme, an enzyme in human tears and nasal mucus. This enzyme proved to be mildly antibacterial, but it was not very effective against most human infections.

In 1928, while attempting to grow the bacteria *Staphylococcus* spp. on an agar plate (a dish used for preparing bacterial cultures), Fleming noticed that the growth of this bacterium was inhibited by a mold that had accidentally

contaminated the plate. He decided to identify the mold, which was eventually called *Penicillium notatum*. Fleming was excited by this discovery. He cultured the mold in a special broth and injected the broth into some of his patients, who had various infectious diseases. The results were encouraging, and the broth proved to be nontoxic. Unfortunately, though, Fleming had not made enough of this broth, making his experiment rather limited. When he presented a paper on his findings in 1929, his colleagues in the medical profession were not particularly impressed or interested. It took two other gifted researchers- Doctors Florey and Chain, working at Oxford University in the late 1930s and early 1940s-to realize the importance of Dr. Fleming's findings. It was their pioneering work that brought penicillin into clinical use. Florey, an Australian doctor, had gone to Oxford on a scholarship to study pathology. Chain was a German chemist who had fled from the Nazis in the 1930s and had come to rest in England. Florey was eager to form a group of researchers who were interested in finding effective antibacterial substances. He was the microbiologist and clinician, while Chain was the chemist capable of isolating, purifying, and studying the properties of such substances. Their research team was made up of twenty of the best scientists in Britain at that time. They focused their attention on the work of Alexander Fleming and worked at purifying penicillin and testing its effectiveness.

In 1935, a German researcher showed that a dye called Prontosil Red cured mice that were infected with *Streptococcus* spp. (the bacteria that causes strep throat). Prontosil Red was the precursor of a group of antibiotic-like drugs called sulfonamides or sulfa drugs. These drugs are still in use today. Septra, for example, which contains sulfamethoxazole, is used to treat respiratory and urinary tract infections.

Microbiologists have long known that soil contains very few bacteria that are capable of causing infections in humans. The study of soil bacteria and the reasons why they are not more capable of causing disease was the lifelong work of Selman Waksman, a research scientist at Rutgers University in New Jersey. In 1939, Merck and Company provided Waksman with financial assistance to mount a search for antibiotics in soil microorganisms. In 1943, this search culminated in the isolation of streptomycin, the first antibiotic to offer hope to patients with tuberculosis (TB). This antibiotic is still used today in the treatment of TB. After clinical use in tuberculosis patients, it was soon realized that streptomycin caused side effects not seen with penicillin, including kidney damage and deafness. However, the main problem encountered in the use of streptomycin, and the one that restricted its effectiveness, was resistance. The speed at which bacteria were able to develop resistance to the drug was a surprise to Waksman and his co-workers. Because of this, they were prompted to search for other antibiotics. This search resulted in the development of neomycin, a drug commonly used in antibacterial ointments today.

In 1947, the antibiotic chloramphenicol was used in a clinical trial to treat an epidemic of typhus in Bolivia. Its success in curbing the epidemic led to its use on the other side of the world-treating scrub typhus in Malaysia. In the Bolivian epidemic, all twenty-two patients who received chloramphenicol recovered. Of the fifty patients for whom the antibiotic was unavailable, fourteen died. The trial in Bolivia is not the only South American link with this antibiotic. Chloramphenicol was first isolated from a soil sample in Caracas, Venezuela, a discovery that was important in two ways. First, it identified a new antibiotic substance; second, as the clinical trial showed, chloramphenicol could cure previously untreatable diseases, such as typhus. Later, this same antibiotic showed remarkable results in the treatment of typhoid fever. At last scientists were finding effective substances that could treat serious infections. The euphoria surrounding the discovery of chloramphenicol was dampened somewhat when it was shown to cause serious side effects. By 1950, many investigators had become alarmed by the mounting evidence linking it with serious blood disorders, including anaemia and leukaemia.

Today, the use of chloramphenicol is limited in developed countries, where more expensive but safer drugs are available. In developing countries, however, it is still widely used because it is so inexpensive to produce. It is used mainly to treat typhus, typhoid fever, meningitis, and brucellosis, but it can also be used for other infections. You may have used it yourself-in ear drops or eye drops.

In the mid-1940s, Giuseppe Brotzu, rector of the University of Cagliari in Sardinia, isolated an antibiotic-like substance from a mold. He conducted clinical trials with the substance (albeit in an impure form) and achieved very good results, particularly in the treatment of staphylococcal infections and in typhoid fever.

Brotzu published his results in 1948, and his work came to the attention of Florey's research group in Oxford. When they obtained samples of the fungus, they were able to isolate and purify several penicillin-like antibiotics. These were called cephalosporin. The cephalosporins are very effective in treating a wide range of bacterial infections. They destroy bacteria in a manner similar to penicillin and are valuable alternatives, especially where resistance to penicillin is a problem. The added advantage is that they have very low toxicity, although allergic reactions develop in about 5 percent of patients. Modifications of the basic cephalosporin chemical structure led to the development of a whole range of these antibiotics for clinical use. Research into the development of new cephalosporin continues today. Further research took place during the 1960s, which led to the development of the second generation of antibiotics. Among these was methicillin, a semi-synthetic derivative of penicillin produced specifically to overcome the problem of penicillin resistance. Methicillin was hailed as a major breakthrough in the

fight against bacterial resistance to penicillin, and scientists believed that they could now win this battle. Unfortunately, bacteria had the last word, and we now have bacteria that are resistant to methicillin.

Ampicillin is also a derivative of penicillin. It was developed to broaden the range of infections that penicillin could treat and has now replaced penicillin to a great extent. It is often the first choice in the treatment of a whole range of infections, including respiratory and urinary tract infections.

Amoxicillin is another widely used penicillin derivative. Like ampicillin, it has a broad range of activity, as it can treat both Gram-positive bacteria (those bacteria that retain the violet stain in a process called Gram's method or Gram's stain, used to classify bacteria-e.g., *Streptococcus* spp. and *Staphylococcus* spp.) and Gram-negative bacteria (those bacteria that do not retain the violet stain used in Gram's method- e.g. *E.coli* and *Haemophilus influenzae*).

Gentamicin is in the same family of antibiotics as streptomycin (the anti- TB drug discovered in 1943). It is generally reserved for serious infections, as it can have severe toxic side effects on the ears and kidneys.

Recently, a new family of antibiotics called the fluoroquinolones has been developed by pharmaceutical laboratories. In addition to being effective against a broad range of bacteria, these antibiotics can reach a high concentration in the bloodstream when taken orally. This means that many more infections that may once have required a hospital stay can now be treated at home. The fluoroquinolones are often used for cases in which long courses of antibiotics (weeks to months) are required. A whole range is now available, and is proving effective against bacteria that were once difficult to treat, such as the leprosy bacteria.

The continuing success of a biotechnologist in the search of microbial metabolites as antimicrobial compounds (antibiotics) is useful in human, animal and plant diseases for stimulating the belief that combating microorganisms constitute an inexhaustible reservoir of compounds with pharmacological, physiological, medical or agricultural applications.

Antibiotics continue to play a crucial role in the development of tissue culture techniques and basic screenings, primarily in biochemistry, molecular biology, microbiology and genetics including genetic engineering and to a lesser extent, pharmacology and organic chemistry.

#### **Source of antibiotic producing microorganisms:**

Antibiotics are produced by many microorganisms in various ecological conditions. Producers of antibiotic can be found in rivers, lakes, decaying plants and animal remains etc. but majority of microorganisms that produce antibiotic inhabits soil.

**Table 1.** Microorganisms producing the various antibiotics

Sl. No.	Microorganisms	Antibiotics
1.	<i>Bacillus licheniformis</i>	Bacitracin
2.	<i>Cephalosporium acremonium</i>	Cephalosporin C
3.	<i>Penicillium chrysogenum</i>	Penicillins
4.	<i>Streptomyces antibioticus</i>	Actinomycin, Oleandomycin
5.	<i>Streptomyces griseus</i>	Indolmycin, Streptomycin, Candicidin
6.	<i>Streptomyces kanamyceticus</i>	Kanamycin
7.	<i>Streptomyces fradiae</i>	Neomycin
8.	<i>Streptomyces albinogen</i>	Puromycin
9.	<i>Streptomyces snyderensis</i>	Siomycin
10.	<i>Streptomyces chrooclorus</i>	Streptothricin
11.	<i>Streptomyces subtilis</i>	Penicillin, subtilin
12.	<i>Streptomyces ranganathensis</i>	Monensin
13.	<i>Streptomyces venezuelae</i>	Chloramphenicol
14.	<i>Streptomyces verticillatus</i>	Mitomycin
15.	<i>Penicillium griseofulvum</i>	Griseofulvin
16.	<i>Streptomyces aureofaciens</i>	Chauli
17.	<i>Streptomyces radekeri</i>	Polynitritin
18.	<i>Streptomyces agalacticus</i>	Celesticetin
19.	<i>Streptomyces sp. X-53</i>	Echinomycin
20.	<i>Streptomyces cacaoi</i>	Polygonins L & M
21.	<i>Streptomyces sp. P-8648</i>	Vindogrisein
22.	<i>Streptomyces sp. P-8648</i>	Neobiosin
23.	<i>Streptomyces sp. P-8648</i>	Theromonosorin
24.	<i>Thermophilicactinomycetes</i>	Thermomycin, Thermocyridin, Refcin (anthracin)
25.	<i>Streptomyces spinosus</i>	Spinosad
26.	<i>Streptomyces hygnoscopicus</i>	Rapamycin
27.	<i>Streptomyces pencetius</i>	Avermectin
28.	<i>Streptomyces erythrea</i>	Erythromycin

### Concepts of Industrial Research in Antibiotic Production.

The industrial fermentation industry received its greatest expansion and profits with the advent and exploitation of antibiotics as chemotherapeutic agents. The demand for penicillin during World War II and later for Streptomycin and other antibiotics, brought on the undertaking of intensive research programs designed to find organisms capable of producing good antibiotics, and oriented toward the development of means for producing antibiotics on a large scale. New cultural procedures were devised, and the technique of submerged agitated-fermentations in deep-tank fermenters came into action. As a result, much of the knowledge gained during the development of antibiotic fermentation processes then became available for the commercial development of other new antibiotic fermentation processes on a large scale production. Screening of antibiotics has been widely performed for about 30 years, and new antibiotics are still being found. However, the

possibility of discovering new antibiotics merely by random screening is reduced now a days and new approaches are required for finding new antibiotics efficiently. In screening of new antibiotics, three major factors must be considered i.e., detection method, selection methods. These days, new strain development for antibiotic production has been essential prerequisite for scale up of antibiotic production and also for search of new antibiotics.

The organisms susceptible to the inhibitory or lethal effect of an antibiotic constitute its spectrum. According to their spectra, antibiotics may be classified as:

- (1) Antibiotics mainly effective against Gram-positive bacteria
  - (a) Those employed for systemic infections e.g. *Penicillins*, *Erythromycin*, *Lincomycin*, *Oleandomycin*, *Vancomycin*, *Novobiocin* and *Fucidin*.
  - (b) Those employed topically e.g. *Bacitracin*.
- (2) Antibiotics mainly effective against Gram-negative bacteria
  - (a). Those used mainly for systemic infections e.g. *Streptomycin*, *Kanamycin*, *Gentamicin*, *Colistin*, *Polymyxin B* and *Cycloserine*.
  - (b). Those used locally in the intestines e.g. *Paramomycin*.
- (3) Antibiotics effective against both Gram-positive and negative bacteria
  - (a). Those employed for systemic infections e.g. *Ampicillin*, *Amoxycillin*, *Carbanecillin*, *Cephalosporins*, *Rifamycins*.
  - (b). Those employed topically e.g. *Neomycin*, *Tyrothricin* and *Framycetin*.
- (4) Antibiotics effective against both Gram-positive and Gram negative bacteria, rickettsiae and Chlamydia – *Tetracyclines* and *Chloramphenicol*.
- (5) Antibiotics effective against acid-fast bacilli (*M.tuberculosis*):- *Streptomycin*, *Cycloserine*, *Viomycin*, *Caprieomycin*, *Kanamycin* and *Rifampicin*.
- (6) Antibiotics effective against protozoa: - *Paramomycin*, *Tetracyclines*, *Fumagillin*.
- (7) Antibiotics effective against fungi: - *Nystatin*, *Amphotericin B*, *Griseofulvin*, *Hamycin* and *Pimaricin*.
- (8) Anti-inflammatory antibiotics e.g. *Actinomycin D*, *Mitomycin* and *Azaserin*

Richard A. Nelson *et al.*, (1986) isolated a microorganism designated as Rv-79-9-101 and now identified as *Micromonospora purpurea chromogenes* subspecies halotolerans, from a mud sample in the Philippines, has shown to produce a complex of antibiotics called crisamicins. Thin layer chromatography and bioautography, employing solvent extracts of whole fermentation broths, revealed a minimum of five antimicrobial components. The major biologically active component of the antibiotic complex-crisamicin A, was obtained in pure form after preparative silica gel column



chromatography followed by crystallization. Based on physicochemical data crismicin A has been identified as a novel member of the isochromanequinone group of antibiotic. It exhibits *invitro* activity against gram positive bacteria but little or no activity towards gram-negative bacteria or fungi.

MP Lechevalier *et al.*, (1989) isolated a novel family of antitumor antibiotics, the calicheamicins from the fermentation broth of *Micromonospora echinospora* subspecies Calichensis. These antibiotics exhibited significant activity against gram-positive and gram-negative bacteria *in vitro*. Shu-Wei Yang *et al.*, (2005) reported a new microbial metabolite Sch725424 isolated from the culture of *Kitasatospora* sp. The structure elucidation of 1 was accomplished based on NMR spectroscopic analyses as well as extensive structure elucidation of its dehydration product Sch 725428 (2). Compound 1 showed inhibitory activity against *Staphylococcus aureus* with MIC values 1 ~2 g/ml, and also displayed weak antifungal activity against *Saccharomyces cerevisiae* (PM 503) with an MIC 32 g/ml.

*Bacillus subtilis* and *Bacillus pumilus* were isolated from soil and screened for the production of antibiotics by plate assay and then cultured in shake flask fermentation at 30°C for further studies. Identification of antibiotics was done by paper chromatography. Bacitracin was found to be produced by both the strains against *Micrococcus luteus* (ATCC# 10240), whereas; *Staphylococcus aureus* (ATCC# 6538) proved to be resistant to Bacitracin produced by *Bacillus pumilus*. The maximum production of Bacitracin from *B. subtilis* and *B. pumilus* against *Staphylococcus aureus* and *Micrococcus luteus* at different pH (6-9), incubation time (0-144 hours) and glucose concentration (1-5%) was checked by agar diffusion assay as detected by the size of zones of inhibition. Maximum zones of inhibition were observed at pH 8, 5% glucose and after 24 hours of incubation at 30°C against *Staphylococcus aureus* and *Micrococcus luteus*. (Muhammad awais, *et al.*, 2007).

Bacterial antagonism is a phenomenon in which growth and activity of one organism is inhibited by growth of other. Generally the organism produces an inhibitory product (may be antibiotic) that does not allow the other organism to grow.

Enterococci are responsible for urinary tract, wound, intra-abdominal and pelvic infections (Barsby *et al.*, 2001). The increase of vancomycin-resistant enterococci (VRE) as important agents of nosocomial infections is cause for great concern (Perl, 1999). It is thought that a selective pressure favouring the survival and spread of VRE was the consequence of the use of antibiotics in food and agricultural practices (Bax, 2000). Actually, there are no effective antibiotics currently available for such organisms. Even worse, vancomycin-resistance is often associated with multiple-drug resistance (Perl, 1999).

Another cause of great concern is the Gram-negative antibiotic-resistant

opportunistic pathogens. These bacteria, like *Pseudomonas aeruginosa*, are common environmental organisms, which act as opportunistic pathogens in clinical cases where the defence system for patient is compromised (Lyczak *et al.*, 2000). For instance, over 80 % of cystic fibrosis (CF) patients become chronically infected with *P. aeruginosa* (Lyczak *et al.*, 2000). In addition, other intrinsically antibiotic resistant organisms such as *Burkholderia cepacia* and *Stenotrophomonas maltophilia* (Saiman *et al.*, 2002), are emerging as opportunistic pathogens. Interestingly, changes in the bacterial phenotype have been observed concomitant with the appearance or increase of antibiotic resistance. Indeed, in CF infections, initially, strains are non mucoid, but over time a mucoid population showing slow growth phenotype with an increased capability to form biofilms, the small colony variants (SCV), develops (Haussler *et al.*, 1999). This ability is considered a major virulence trait because the bacteria are protected from adverse environmental conditions as well as from biological and chemical antibacterial agents (Haussler, 2004). Thus, new therapeutic drugs and/or approaches are needed to improve the management of these diseases and overcome these problems (Taylor *et al.*, 2002).

#### **Conclusion:**

Screening of antibiotics has been widely performed for about last 50 years and new antibiotics are still being found. In screening of new antibiotics, new approaches are required where following three factors must be considered i.e. detection of antibiotic producing microorganisms, selection of producing microorganisms and cultivation methods. These are closely related to each other, and their efficient combination is essential for successful screening of an antibiotic. As the antibiotics are secondary metabolites, they are synthesized in trace amounts in an ordinary fermentation. Moreover the synthesis of antibiotic is regulated by tight metabolic and genetic regulation. Therefore it is the task to the biotechnologists to modify the wild type strain and to provide cultural conditions to improve the productivity of antibiotics. Improvement of the microbial strain offers the greatest opportunity for cost reduction without significant capital investment. The desired result of strain improvement is the ability of a manufacturing process to meet additional demands without adding more production scale fermenters.

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## Macrozoobenthos Diversity in Selected Stretch of Narmada River, Central Zone of Madhya Pradesh

\* Hema Ahirwar

\*\* Sudhir Mehra

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**Abstract-** *The aim of present study was to assess the diversity and density of macrozoobenthos in selected stretch of Narmada River. During the study area covered into two districts (Hoshangabad and Sehore) of Madhya Pradesh. Samples have been collected from five locations between Sakatpur to Aamlighat (Sakatpur, Bandrabhan, Sethani-Ghat, Dongarwada and Aamlighat) covering an approximate 50 kms central stretch of River Narmada. The Results of the study revealed that 51 taxa of macrozoobenthos were recorded from these sampling stations. During the study, it was observed that phylum arthropoda was in dominated group than phylum mollusca and annelida. The statistical procedure (Shannon, Margalef and evenness index) were also applied for accessing the diversity of macrozoobenthos.*

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**Key Words-** Narmada River, Macrozoobenthos, Diversity indices

**Introduction:** River ecosystem encircles a wide spectrum of habitats spanning a continuum from small mountain springs to large lowland rivers (Hynes 1975). Rivers are the most important fresh water resources for living being and provide a home to many plants and animals including macrophyte, plankton, insects and mollusca etc. Benthic communities are very important in aquatic ecosystem and common inhabitants of lakes and streams. These organisms usually inhabiting the bottom substrate for at least part of their life cycle (Rosenberg and Resh 1993). The benthic macro-invertebrates community of the lotic ecosystem, like other communities has a series of attributes that do not reside in its individual species components and have meaning only with reference to the community level of integration such as species diversity, growth in the form and structure, dominance, relative abundance and trophic structure. One of these attributes many of these or all, depending upon situation may be changed with the changing ecology of the water body concerned. Species are distributed individualistically according to their own genetic characteristics and population of most of the species tends to change gradually along the environmental gradients. Most species are not in obligatory associations with other species, which suggests that

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\* Research Scholar, Department of Zoology, Safia Post Graduate College, Bhopal (M.P)

\*\* Department of Zoology, Safia Post Graduate College, Bhopal (M.P)

association is formed with many combinations of species, and vary continuously in space and time. Hence, a study of benthic macro-invertebrates community composition and dynamics of different population of the community becomes a reliable source to provide the picture of environmental status and influence of changing limnology of the water body concerned (Bhandarkar and Bhandarkar, 2013). The aim of the present study was to measure the diversity of benthic macro-invertebrates in the selected stretch of Narmada River in the central zone of Madhya Pradesh.

#### **Materials and Methods:**

**Study area:** During the study we have selected study area covered into two districts (Hoshangabad and Sehore) of Madhya Pradesh. Samples have been collected from five locations between Sakatpur to Aamlighat (Sakatpur, Bandrabhan, Sethani-Ghat, Dongarwada and Aamlighat) covering an approximate 50 kms central stretch of River Narmada.

**Macrozoobenthic diversity:** The biological parameter mainly benthic macro invertebrates are not randomly distributed over a stream but on a relatively homogenous bottom, animal tend to occur in a cluster. Different habitats (mud, gravel, rock surfaces, organic material, silt and sandy sediments) support different benthic organisms'. Since they dwell at or below the surface of bottom sediments, they are collected with the help of mud samplers.

**Collection and preservation of Macrozoobenthos:** Sediment samples from the bottom at different stations were collected by D-frame net and Quadrant having an area of 50cm<sup>2</sup>. The samples were collected through washing of stones and pebbles in an enamel tray. Later these samples were screened through a No. 30 standard sieve (11.0 meshes/cm; 06.589 m openings) and benthic organisms were sorted with the help of forceps and preserved in 5% formaldehyde in narrow mouthed plastic bottles. The samples were placed in polythene bags and carried to the laboratory safely.

**Identification of macrozoobenthos:** Identification of all macro faunal organisms was completed with the help of metzer binocular light microscope, stereo microscope, magnifying glass. Benthic invertebrates were identified under the Following standard keys and manuals have been used during the identification.

1. A guide to the study of fresh water biology- Needham and Needham (1962)
2. Handbook freshwater molluscs of India –Subba Rao (1989)
3. Freshwater invertebrate of United states (Pennak 1978).

**Statistical Procedures:** Analysis of raw data is a logistic support towards making proof of any work. After generation, the raw data were compiled properly. During the present study, statistical procedure that was followed is as under with formula:

**Shannon diversity index:** Shannon in 1948 derived a mathematical formula applied to biological system which is the most preferred and common index

among other diversity indices (Mandaville, 2002). Range of this index varies between 0.0 and 5.0 which is denoted by ( $H'$ ). Generally, results come between 1.5 and 3.5, and it exceeds very rarely up to 4.5 (Kocata<sup>o</sup>, 1992). The values above 3.0 indicate about the structure of stable and balanced habitat whereas less than 1.0 value indicates about the pollution and habitat degradation in habitat structure.

$$H' = - \sum [(n_i / N) * (\log N n_i / N)]$$

$H'$  = Shannon Diversity Index

$n_i$  = number of individuals belonging to  $i$  species

$N$  = Total number of individuals

$LN$ : Natural Log base  $N$  of the number

**Pielou evenness index** : Pielou in 1966 derived evenness index from Shannon index. The ratio of the observed value of Shannon index to the maximum value gives the Pielou Evenness Index result and range of this index varies from 0 to 1. When the value is getting closer to 1, it means that the individuals are distributed equally (Pielou, 1966).

$$J' = H' / H'_{\max}$$

$J'$ : Pielou evenness index

$H'$ : The observed value of Shannon index

$H'_{\max}$ :  $LN(S)$

$LN$ : Natural Log base  $N$  of the number

$S$ : Total number of species

**Margalef diversity index:**

The species richness or Margalef's diversity index ( $d$ ) is expressed by simple ration between total species and total number (or importance value  $N$ ), the Margalef's diversity index are proposed by Margalef (1958). It has no limit value and it shows a variation depending upon the number of species. This index is used to compare species richness between different samples collected from various habitats easily. Thus, it is used for comparison of sites (Kocata<sup>o</sup>, 1992). Larger the index value healthier water body, when it tend towards 1.0, pollution is thought to increase and damage should be suspected.

$$d = (S - 1) / \log N (N)$$

$d$  = Margalef Diversity Index

$S$  = Total number of species

$N$  = Total number of individuals

$LN$ : Natural Log base  $N$  of the number

**Result and Discussion:**

During the two years of study period, a total of 51 taxa of macrozoobenthos were recorded in the study area belonging to 3 phyla (Annelida, Arthropoda and Mollusca) in different groups (Table 1). In phylum annelids, Oligochaeta contributing 7 species (13.73%), Hirudinea contributed 1 species (1.96%), phylum arthropods, Coleoptera represented 8 species (15.69%), Hemiptera represented 5 species (9.80%), Ephemeroptera

contributing 4 species (7.84%), Odonata representing 6 species (11.76%), Diptera represented 5 species (9.80%), phylum mollusca, Gastropods representing 10 species (19.61%) and Bivalvia contributed 5 species (9.80%) as shown in (Figure 1.). Similar findings were reported in River Narmada (Shrama et al., 2016 and Kumar and Vyas, 2014) and in Ken River (Nautiyal and Mishra, 2013). During the study the most diversified phylum was Arthropoda contributed 28 species (55%), Mollusca is represented 15 species (29%) and Annelida is least contributing phylum with 8 species (16%). Similar findings recorded by Sharma et al., (2013) in Morand river a tributary of Narmada river and Jhelum River of Kashmir (Abida et al., 2012). During the study the annelids represented least diversity. Similar findings have been reported by various authors (Ishaq and Khan, 2013) in Kalsi Dehradun segment of River Yamuna and (Vyas et al., 2012) in River Narmada near water intake point at Hirani Village in Sehore District of Madhya Pradesh.

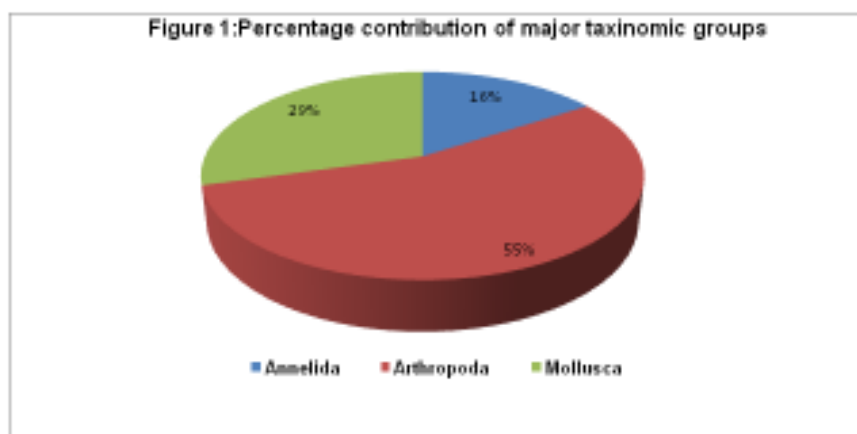


Table 1: Diversity of macrozoobenthos in the study area

S.No.	Taxa	S 1	S 2	S 3	S 4	S 5
<b>Phylum-Annelida</b>						
Class	Oligochaeta					
1	<i>Aulophorus tonkinensis</i>	+	+	+	+	+
2	<i>Lumbricus</i> sps.	+	+	+	+	+
3	<i>Branchiura sowerbyi</i>	-	+	-	-	+
4	<i>Tubifex tubifex</i>	+	+	+	+	+
5	<i>Chaetogaster limnaei</i>	+	+	+	+	+
6	<i>Stylaria</i> sps.	+	+	+	+	+
7	<i>Nais communis</i>	+	-	-	+	-
Class	Hirudinea					
8	<i>Glossiphonia</i> sps.	+	+	+	+	+
<b>Phylum-Arthropoda</b>						
Class	Insecta					
Order	Coleoptera					
9	<i>Agabus</i> sps.	+	+	+	+	+
10	<i>Berosus</i> sps	+	+	+	+	+
11	<i>Dineutus indicus</i>	+	+	+	+	+



12	<i>Ectopria</i> sps.	+	+	+	+	+
13	<i>Gyninus</i> sps.	+	+	+	+	+
14	<i>Psephenus</i> sps.	+	+	+	+	+
15	<i>Dytiscus</i> sps.	+	-	-	+	+
16	<i>Stenelmis</i> sps.	-	+	+	-	-
Order	Hemiptera					
17	<i>Notonecta</i> sps.	+	+	+	+	+
18	<i>Ranatra elongate</i>	+	+	+	+	+
19	<i>Sigarasp.</i>	-	+	-	+	+
20	<i>Nepa</i> sps.	-	-	+	-	+
21	<i>Belostoma</i> sps.	-	+	+	+	-
Order	Ephemeroptera					
22	<i>Beatis</i> sps.	-	-	-	+	-
23	<i>Caenis</i> sps.	+	+	+	+	+
24	<i>Cloeon</i> sps.	+	-	+	-	+
25	<i>Ephemerella</i> sps.	+	-	+	+	-
Order	Odonata					
26	<i>Argia</i> sps.	-	-	+	+	+
27	<i>Progomorphus</i> sps.	+	+	+	+	-
28	<i>Gomphus</i> sps.	+	+	+	+	+
29	<i>Enallagma</i> sps.	+	+	+	+	+
30	<i>Cordulegaster</i> sps.	+	-	+	-	+
31	<i>Anax</i> sps.	-	+	-	+	-
Order	Diptera					
32	<i>Chironomous</i> sps.	+	-	-	+	+
33	<i>Pentaneura</i> sps.	-	+	+	-	-
34	<i>Chetogaster</i> sps.	+	+	+	+	-
35	<i>Simulium</i> sps.	-	+	-	+	+
36	<i>Tabanus</i> sps.	+	-	+	+	+
<b>Phylum-Mollusca</b>						
Class	Gastropoda					
37	<i>Viviparus</i> sps.	+	+	+	+	+
38	<i>Bellamyia bengalensis</i>	+	+	+	+	-
39	<i>Paludomus acuta</i>	+	+	+	+	+
40	<i>Gyraulus labiatus</i>	+	-	+	+	-
41	<i>Lymnaea acuminata</i>	+	-	+	+	+
42	<i>Thaira scabra</i>	+	-	+	+	+
43	<i>Thaira tuberculata</i>	+	+	+	+	-
44	<i>Thiara lineate</i>	-	+	+	+	+
45	<i>Brotia costula</i>	+	-	-	+	-
46	<i>Tarebia granifera</i>	+	-	+	-	+
Class	Bivalvia					
47	<i>Corbicula striatella</i>	+	+	+	+	+
48	<i>Lamellidens jenkinsianus</i>	-	+	+	+	+
49	<i>Parreysia caerulea</i>		-	-	+	-
50	<i>Parreysia corrugate</i>	+	+	-	+	+
51	<i>Parreysia occata</i>	+	-	+	-	+
		38	34	40	43	37

Table: 2.

Numeric values of macrozoobenthos at different sampling sites of the study

Variables	S1	S2	S3	S4	S5
Taxa S	38	34	40	43	37
Individuals	17851	9936	12372	16981	10207
Shannon H	3.308	3.219	3.392	3.495	3.415
Evenness e <sup>H/S</sup>	0.7196	0.7351	0.7434	0.7661	0.822
Margalef	3.779	3.585	4.139	4.312	3.9

During the present study, data was analyzed statistically and results obtained from the analysis are given in Table- 2. The range of Shannon diversity index varied between 3.219 and 3.495. The minimum value was observed at station- S2, while maximum value was recorded at station- S4 (Figure- 2). Wilhm and Dorris, (1966) proposed a relationship between species diversity and pollution status of sampling sites as; species diversity value greater than 3.0 is clean water, values in the range of 1.0-3.0 indicate moderate pollution and values less than 1.0 indicate heavy pollution. All the sampling station fall under clean water condition (index value more than 3.0).

The values of Pielou evenness index ranged between 0.71 and 0.82. Minimum range was recorded at station- 1, whereas maximum range was observed at station- 5 (Table 2 & Figure 2).

The Evenness values showed a greater equitability in the apportionment of individuals among the species at all sampling stations because value of index was very much nearby 1.0. According to Mukherji and Nandi (2004) higher the values indicate a low concentration of dominance of species diversity at a specific site. When all species in a sample are equally abundant an evenness index would decrease towards zero as the relative abundance of the species diverges away from evenness (Anitha et al., 2005).

The values of Margalef diversity index were between 358– 4.312. The lowest value was for site S2 and the highest value was for site S3. This index shows variation depending on number of species, so that the number of individuals is less important for calculation (Table 2 & Figure 2). According to Margalef (1956) the higher diversity values reflect the suitability of habitat for the organism in one hand while on the other the high species diversity has been reported to be correlated with longer food chain and complex food web of the ecosystems and also more stable community. Extremely low species richness and low abundance are commonly observed in physically disturbed areas with poor condition of colonization by aquatic organism (Bhandarkar and Bhandarkar, 2013).

#### **Acknowledgement:**

Authors are very much thankful to University Grant Commission, New Delhi India for financial support to conduct this study under National Rajeev Gandhi Fellowship Program.

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