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Sufi Silsilahs in South Asia: A Brief Sketch and Preliminary Observations

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Introduction

The study of Sufism, Sufis and their sacred *khanqahs* (monasteries) and Dargahs has become a prominent area of research in social sciences during the later half of 20th century. Obviously, it is a multi-disciplinary research area. Though pursued largely by anthropologists, sociologists, historians and scholars of religion it is generally forgotten that such studies are inherently geographical in nature. One of the basic characteristics of Sufis and their Dargahs is the *silsilahs* (Sufi orders) that has immense geographical substance.

Sufi *silsilahs* have their own place of origin and their diffusion over time through the agency of Sufis and their Dargahs attract pilgrims from various areas. Moreover, these Dargahs besides being having both intra and inter-linkages among themselves also have considerable regional variations. Hence the basic geographical concepts of place, diffusion, network and regional variation inherently make their studies geographical in nature.

Objective of the Study

The main objective of the study is to briefly describe various Sufi *silsilahs* in South Asia. It also aims to convince, not only the scholars in allied fields but also geographers, that such studies are fundamentally geographical in nature.

Scope of the Study

The scope of the study is defined by the broader parameters of cultural geography in the study of Dargahs and Sufi *silsilahs*. However, despite linking them to the roots, it is restricted largely to those *silsilahs* that entered or developed in South Asia. Consequently, the *silsilahs* (including their sub-orders) like Chistiya, Suhrawardi (both Ba-Shara and Be-Shara),Qadiriya, Naqshbandiya, Malamatiya, Kubrawiya, Madariya and some other minor orders have been described.

Data and Method

The study is largely based on the historical material available in various types of sources like *Maktubat* (correspondence of the Sheikh), *Malfuzat* (conversation and discourses of the Sheikh) and *Tazkira* (compiled anecdotes of the Sheikh). We have tried to trace the evolution of the

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silsilahs, their splitting up into various levels of sub-orders and diffusion of their shrines. Of course, because of the inherent limitations of data it becomes difficult to understand the process historically (Nizami, A. R. and M. Khan. 2012: 40). The problem becomes more complex when either the name of the founder, his life span, or place of dargah is not mentioned in historical chronicles.

Conceptual Background

Without referring to various types of controversies related to origin and antiquity of Sufism (Esposito, J. L. 2003: 334; Suvorova, A. 2004: 8-9; Nasr, S. H. 1972: 11-12; Burckhardt, T. 1990: 15), one can infer from the Sufi literature that almost all the *silsilahs* trace their origin from the Prophet. His teachings attracted a group of noble scholars, *AhleSuffe,* (Khanam, F. 2006:9). With time contemplativeness of Sufis developed a system of purification (Tirmingham, J. S. 1972: 2) and to become the part of this system the aspirant has to accept the authority of his *pir* (Tirmingham J. S. 1973: 4). After learning the acts of devotion, and passing through the stages of communion with God, the *murid* is designated as *salik* (traveler) on the way of *tariqah* (Sufi path) (Rastogi, T. C. 1990: 55).

The rituals and practices of each order (*silsilah*) have been handed down through a continuous chain of succession. These *silsilahs* have been very well explained by the scholars but the organizational aspect of the Sufi spirit has more or less been neglected. The 12the century saw the crystallization of Sufi *silsilahs* as a chain of linkages through which the spiritual genealogy of the Sufi*s* could be traced. The establishment of these Sufi orders placed Sufism on a firm and organized basis. The organization of Sufis into an established *Piri -Muridi* order made the movement more meaningful to individual Sufis and their followers. It needs emphasis that the orders were distinguished by their own distinctive teaching practices.

In most of the orders, the *pir* anoints his *khalifahs* (disciples) and sends them to various *wilayats* (provinces) so that they could spread the message of love and brotherhood and propagates the philosophy of Sufism. Subsequently, these *khalifahs* appoint their own subordinates to explore other areas and establish their newer *wilayats*. Hence it may be observed that this diffusion is not on the basis of physical characteristics of an area but on the spiritual attractions of the *pir* towards that area (Nizami, K. A. 1978: 175). These sacred landscapes and places of pilgrimage are important signifying system encoded with religious and mystical symbols (Singh, J. P. and Khan M. 2002: 30; Akhtar, Z. and M. Khan 2011:1; Khan M. and A. R. Nizami: 2011; Nizami and Khan 2012: 38). They not only attract the pilgrims but also act as a node to transcend barriers of religion, caste, color and gender.

Prominent Sufi *Silsilahs*

This study attempts to arrange the *silsilahs* genealogically. Most of the *silsilah*s trace their origin to Hazrat Hasan of Basra, the 'Patriach of Sufism', who learnt *tariqahs* in T*assawwuf* from the

companions of Prophet Muhammad. From there the esoteric roots reach Prophet through Ali ibn Talib with an exception of Naqshbandiya order which trace its roots through first *Khalifah* of Islam, Abu Bakar Siddique. However, the names of Hasan's two disciples' Khwaja Abdul Wahid ibn Zaid and Habib Ajami stand at the head of two main lines of *silsilahs*, (Fig. 1) the Zaidiya and the Habibiya, which again had their own sub-divisions.

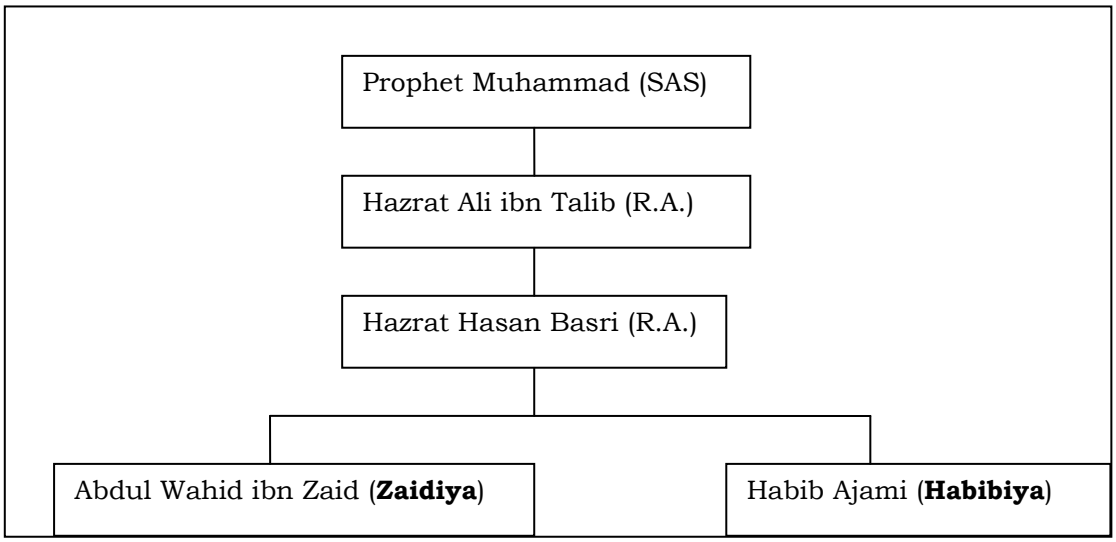

Fig. 1 Genealogical Roots of *Silsilahs*

A. Zaidiya – This Sufi fraternity owes its existence to Khwaja Abdul Wahid ibn Zaid. The order was further divided into various sub-orders.
   - **Iyadiya**: The founder of this Sufi order was Fuzail ibn Iyad successor of Abdul Wahid ibn Zayd . He is buried in Mecca.
   - **Adhamiya**: As denoted by its name, the Sufi order was started after the name of Ibrahim ibn Adham who was a successor and a disciple of Fuzail ibn Iyad. Sultan Ibrahim ibn Adham, belonged to a royal family but voluntarily abdicated the throne to become a Sufi. He is buried in Jerusalem, Palestine.
   - **Hubairiya**: Khwaja Hubaira, a successor of Ibrahim ibn Adham was the founder of Hubairiya Order. Very little is known about him except that he was long in the company of famous Sufi saint - Junayd of Baghdad.

1. **Chishtiya:** The origin of this order owes to Khwaja Abu Ishaq Shami Chishti. One of the first among Chishti Sufi order to call himself Chishti Shami is believed to have met a Sufi who directed him to settle in Chist (Afghanistan) and accordingly became known as Chishti. He died in 966 AD in Damascus and lies buried in Mt. Qasiun where later on Ibn-al-Arabi was also buried. Chishti order is considered as one of the oldest, existing Sufi order in the world. According to most of the Sufi orders, this order is considered to be originated directly from Prophet.

Chishti saints adopted following rituals like reciting the names of Allah loudly sitting in a prescribed posture at a prescribed time, reciting the names of Allah silently, regulation of breath, contemplation and performing *Chilla* (40 days of spiritual confinement).

The early Sufi saints of Chishtiya order established their *khanqahs* mainly in Rajasthan, Delhi, Uttar Pradesh and Punjab. During the times of Khwaja Fariduddin Ganj-e-Shakar, Hazrat Nizamuddin Auliya and Hazrat Nasiruddin Chiragh the influence of the order extended all over South Asia (Nizami, A. R. and Khan, M 2012: 60). During this period, the order possessed a highly integrated social structure, which was centrally controlled and guided by the activities of those who were associated with it. However, after the death of Sheikh Nasiruddin Chirag-e-Delhi (R.A.), the central organization of the Chishtiya Order broke down into provincial monasteries (*khanqahs*). They no longer owed any direct allegiance to the central authority (Dhaul, L. 2004: 105). However, at the time of *urs* at Ajmer followers of all these *khanqahs* assemble and pay their homage.

Over the time, the *Chishtiya silsilah* developed its own sub-orders such as *Qutubi* (Khwaja Qutubuddin Bakhtiyar Kaki), *Faridi* (Sheikh Fariduddin Ganj-e-Shakar), *Nizami* (Hazrat Nizamuddin Auliya), *Sabiri* (Sheikh Allauddin Ahmad Sabir), *Nasiri* (Sheikh Nasiruddin Chirag-e-Delhi), *Ashrafi* (Sheikh Ashraf Jahangir Simnani), *Niyazi* (Sheikh Niyaz Ahmad) (Nizami, A. R. and Khan, M 2012). The principle of hereditary succession was also introduced in the *Silsila*. This was a deviation from one of the main traditions of early Chishti saints namely that of the selection of successors by the departing *Pir*, under divine guidance (Dhaul, L. 2004: 105).

B. **Habibiya**: The order was started by Habib Ajami, a usurer who finally became a disciple of Hazrat Hasan of Basra. The sub divisions of this order are:
    - **Kharkiya** – This Sufi order was started by Maaruf-al-Kharki who belonged to Khark, a district in Baghdad. His *Pir* was Daud Taee who was a disciple of Habib Ajami.
    - **Saqtiya** – Khwaja Hasan Sari-us-Saqati was the founder of this *silsilah*. Saqati is added to his name as he was a huckster in the bazaar of Baghdad.
    - **Taifuriya** – This *Silsilah* was founded by Abu Yazid Taifurul Bistani who was also known as Bayazid-us-Taimi. A distinctive feature of this order is its emphasis on *sukhr* (intoxication of love of God) and *wajd* (rapture).
    - **Junaidiya** – Junaidiya *silsila* was founded by Abul Qasim Junaid who was a successor of his maternal uncle Sari- us -Saqti.
    - **Gazruniya** – It was founded by Khwaja Abu Ishaq Gazruni who was fourth in the line of succession from Abul Asim Junaid.
    - **Tartausiya** – This Sufi order was founded by Abul Farah Tartausi who was also in the line of succession from Abul Qasim Junaid.

- **Firdausiya** – The founder of this Sufi order was Badaruddin Firdausi of Bukhara whose *khalifa* Najibuddin Muhammad Firdausi (1300), who lies buried in Delhi, introduced this order in India.

2. Suhrawardi – This *silisilah* was started by Sheikh Bahauddin Suhrawardi, a native of Multan born in the Quresh tribe in 1182. Though according to '*Khulsatul Afrin'* Sheikh Bahauddin was a grandson of Abdul Qadir Jeelani (R.A.), the founder of Qadiri order. There are many and varied stories about the spiritual attainment of Sheikh Bahauddin and almost all of them reveal how he was always lost in ecstasies. Besides Multan (the parent Dargah of this silsilah) that has six shrines, Lahore and Delhi have more concentration of Suharwardi shrines. The Suharwardi shrines are also found in Srinagar, Gujrat (Pakistan), Uch, Ahmadabad, Patan, Shahjahanpur, Badaun, Behraich, Zafrabad and Kalpi. The Suharwardi order is roughly organized into two groups. The classification would facilitate an understanding of some saints who laid stress on the `Saint's -worship' and on ecstatic experience besides a few of them resorted to hypnosis and to consuming intoxicants. The two main divisions are

2.1 **Ba-Shara** (According to *Shariyat* i.e. Islamic Canonical Laws)

2.2 **Be-Shara** (Not according to *Shariyat*)

2.1 **Ba-Shara** – This sub-division is based on the traditions largely according to *Shariyat*and is further divided into five main sections

2.1 (a) **Jalali** – This order were founded by Syed Jalaluddin Shah Surkhposh, one of the adherents of Bahauddin Zakariya Suharawardi. He was born in Bukhara from where he came to India and settled down at Uch in Sindh. His tomb is at Rasulabad near Ahmadabad.The Jalali *faqirs* wear black threads round their heads and an amulet round their arms. The amulet is said to be made in the form of the seal of Prophet Muhammed.

2.1 (b) **Makhdumi** – The founder of this sub order was Mir Syed Jalaluddin Makhdum-i-Jahaniyan Jahangasht Bukhari who was a grandson of Syed Jalaluddin Shah Surkhposh. The saint died in 1383 and is buried at Uch.

2.1 (c) **Miran Shahi** – This sub- order was founded by Miran Muhammad Shah Mauj–Darya Bukhari, a descendant of Jalaluddin Surkhposh. He was contemporary of Emperor Akbar who had great respect for the saint. Though buried in Lahore near Anarkali's tomb his shrine is also built at Batala where his dead body was given a ritual bath after death.

2.1(d) **Ismail Shahi** – The founder of this sub order of the Suhrawardi Order was Hafiz Muhammad Ismail, commonly known as Miyan Wadda who died in 1683.

2.1 (e) **Dawla Shahi** – This sub order was founded by Dawla Shah, a disciple of Sayyid Nasir Mast Sialkotwi. He moved to Gujarat.

2.2 Be-Shara – This order is based on the traditions which may be considered deviations from the *Shariyat*.

2.1 (a) **Lal Shahbaziya** – It was founded by Syed Lal Shahbaz who described himself as a vicegerent of Bahauddin Zakariya. However, hagiographers have described him as a libertine. Contrary to the precepts of Islam, wine and other intoxicants were his drinks. He died in 1324. The Sufis of this order put on red garments and have permission to drink wine. The number of disciples in this order is fast declining.

2.2 (b) **Suhagiya** – The founder of this sub-order was Musa Shahi Suhag who was a vicegerent of Jalaluddin Surkhposh. He later settled in Ahmedabad and died in 1449. The followers of this sect adorn Saint Musa and style themselves as *Sada Suhagin*, literally a lady with a loving and affectionate husband (God).

2.2 (c) Rasul Shahi – This sub order was founded by Syed Rasool Shah. The followers of this sect regard drinking spirit as a virtue. It is a very small sect mostly found in Lahore.

3. Qadiriya – Abdul Qadir Jeelani (R.A.) whose tomb is in Baghdad was the founder of this Sufi order. He is highly revered in South Asia and is known as *Piran-i-Pir Dastgir*. Syed Bandagi Muhammad Gaus a descendant of Abdul Qadir Jeelani settled at Uch in Sindh and established this order. Over the time, this *silsilah* expanded fast and now its shrines are widespread in South Asia. The first cluster of shrines of this order is found in the northwestern part. The maximum numbers of shrines are confined in Uch and Srinagar. Besides these, other shrines are found in Gujrat (Pakistan), Sialkot, Lahore, Kasur and Multan. The second cluster, in the northern part, includes the shrines at Sirhind, Panipat, Delhi, Bareli and Agra. The third cluster is most prevalent encompassing Dargahs at Ujjain, Burhanpur, Ahmadnagar, Bider, Gulbarga, Bijapur, Warangal, Golconda, Hyderabad and Karnool. This order has more than twenty sub- orders. Some of the prominent among them are:

3.1 **Qumesiya** – This sub-order was founded by Shah Qumes who lived in Bengal and flourished during the times of Sher Shah Suri, Humayun and Akbar. Shah Qumes and his father Abdul Hayat are counted among pioneers of *Qadiri* Order in South Asia.

3.2 **Bahlol Shahi** – The founder of this sub-order was Bahlol Shah Daryai, a disciple of Shah Latif Barri, who himself was a disciple of Hayatul Mir. The followers of Hayatul Mir believe that he is still alive and refer him as *Zinda Pir* – saint endowed with immortal life.

3.3 **Muqim Shahi** – Syed Muqim Mukhamuddin, a vicegerent of Hayatul Mir was the founder of this sub order. Unfortunately, very little is known about Syed Muqim Mukhamuddin, however his great grandfather Syed Bahlol Shah was held in very high esteem.

3.4 **Nawshahi –** The Nawshahi *silsilah* was founded by a descendent of BabaFarid, Shah Maaruf Chishti Qadiri. Records of Shah Maaruf and his vicegerent are quiet scanty. However, the title `nawshah' (bridegroom) came from Haji Muhammad buried in Wazirabad District, a disciple of Maaruf Chishti. A number of famous Saints had their

genealogical links with him and the order has two sub-divisions i.e. *Pak Rehmanis* and *Sachyaris*.

3.5 **Hussain Shahi** – Shah Lal Hussain whose original name was Dhadha Hussain Kalasrai, was the founder of this section. He was fond of wearing red and saffron clothes that's why Lal was added to his name. He is buried in Lahore.

3.6 **Mian Khel Shahi** – Mir Muhammad an immigrant from Siwastan (Sindh, Pakistan) was the founder of this sub-order of Qadiri Order. Dara Shikoh, the eldest son of Emperor Shahjahan, wrote a biography of Miyan Mir named *`Sakinatul Auliya'* and later became disciple of Mullah Shah one of the disciple of Mian Khel Shah (Tirmingham, J. S. 1972: 272).

4. Naqshbandiya – This is the only order which trace its roots to the Prophet through the first *Khalifah* of Islam, Abu Bakar Siddique. Originally known as *Silsila-e-Khwajagan* this order gained momentum during the time of Khwaja Bahauddin Naqshabandi of Turkestan, (d 791AH/1389AD) who is buried near Bukhara and thereafter it was called Naqshbandiya. Later, Khwaja Baqi Billah (d 1012AH/1603AD), buried in Sadar Bazar, Delhi, brought this order to India. The concentration of the shrines of Naqshbandiya Order in confined in the western and northern part of the sub-continent in Peshawar, Anantnag, Kasur, Gangoh, Panipat, Badaun, Lucknow and Tonk. However, a larger number of Naqshbandi shrines are found in Srinagar, Lahore, Sirhind and Delhi.

5. Malamatiya – Since most of the Sufi orders believe that the saints of this order follow some blameworthy practices hence they termed them as Malamatiya (blameworthy). Some of the basic behavioural aspects of these saints include :

a) They normally do not practice Islamic religious obligations and take a libertine and unrestrained way.
b) Quite a few *faqirs* of this order pretend to be affected by hallucination in which their imagination turns riots.
c) They used to utilize music to raise ecstasy.

6. Kubrawiya – This sect started with Najmuddin Kubra (540AH/1145AD – 618AH/1221AD). Born in Khiva (Khwarizm) he followed an ascetic discipline while in Egypt and eventually settled and built his *khanqah* in Khwarism. This order was famous for its practices like *sanads* and *dhikrs.* Over the time this order gave birth to the following sub- orders:

6.1 **Firdausiya** – This was an Indian Branch started by Bakhazi of Bukhara. The order derived its name from his *khalifah*, Badaruddin Firdausi, who introduced the order in India.

6.2 **Nooriya** – It was a Baghdadi branch founded by Abdur-Rehman Israfani

6.3 **Rukniya** – It was a Khurasani branch which was derived by Ruknuddin Abul Makarim Ahmad ibn Sharfuddin who was generally known as Allaud-Daula Simnani.

6.4 **Hamadaniya** – Basically it was a Kashmiri branch of Rukniya, which was founded by Syed Ali ibn Shihabuddin who is buried at Khotlan in Tajikistan (Ross, G.E.D.1895:432-33).

6.5 **Ightishashiya** – A Khurssani branch that was founded by Ishaq-al-Khuttalani, a disciple of Ali Hamadani.

6.6 **Noorbakhshiya** – A Khurasani branch which was derived from Mohammed ibn Abdullah, popularly known as Noorbaksh, a pupil of Ishaq-al-Khuttalani who developed his own distinctive Shii beliefs. This again stemmed into two lines

- Qasim Farid Baksh carried Noor Bakshi and
- Shamsuddin Lahiji built a *khanqah* in Shiraz which branched out independently.

7. Maulaiyya – This sub-order derived from a Persian immigrant Jalaluddin into Anatolia where he received the title of *Mawlana* (Muslim Religious Scholar). It was localized and its influence was restricted to Asia Minor and Ottoman Provinces in Europe. The members of this sub-order became famous for their devotion to music and the nature of their *dhikr*. Although Jalaluddin died in A.H.712/1312 A.D. but his sect had widely spread throughout Anatolia. (Tirmingham, J. S. 1971:60).

8. Qalandariya – Qalandar is one of the names of God. This order derived its name from its founder, Khizr Rumi Qalandar, who was a disciple of Abdul Aziz and also of saints like Abdul Qadir Jeelani, Shihabuddin Suhrawardi, Shah Madar, Fariduddin Attar and Fariduddin Masood Shakarganj (Rastogi, T. C. 1982: 53).

Qalandars are regarded as pious people who serve the acts of austerities in a state of ecstasy. The term Qalandar is applied to an ensemble of *faqirs* who have varying descriptions. Some writers think that they form a group of "begging monks" (Digby, S.1984: 97), other say that they constitute a tribe of nomads who eke out their subsistence by conjuring tricks and entertaining by performing monkeys and bears.

In the Encyclopedia of Islam, the Qalandar is classed as a religious Sufi order, founded in the early 13th Century by Qalandar Yusuf, an Arab of Spain. Qalandars were also present in Damascus (Syria), Egypt and even in India. Khizr Rumi a pupil of Makki introduced Qalandari tradition in the country. It is believed that Khizr Rumi came to India to meet Khwaja Qutubuddin Bakhtiyar Kaki (R.A.) Qutub Saheb initiated Rumi in the Chishtiya order and he in turn received Kaki in the Qalandariya Order.

A disciple of Hazrat Nizamuddin Auliya (R.A.), Syed Nazmuddin Gausu-d-Dahar Qalandar with the consent of his *Pir* became the disciple of Khizr Rumi as well. Rumi

appointed him as his vicegerent. His successor was Qutubuddin Bindal Qalandar Sardarz-e-Ghausi.

One of the important Qalandar is Sharfuddin Bu Ali Shah Qalandar who died in 1324 A.D. Surprisingly, his Dargah is found at both Karnal and Panipat. According to one legend he died at Karnal and was buried there but the people of Panipat disagreed. They dug a few bricks from his grave, carried them in a coffin to Panipat. Surprisingly, after reaching Panipat, it was found that Coffin contained Saint's body. His *Urs* is held both at Karnal and Panipat (Rastogi, T. C. 1982: 55).

9. **Rifaiyya** – Abul Abbas Ahmad ibn Ali ar Rifai (1106-82 AD) inherited Rifaiyya, a derivative of Qadiri order, as a family *silsilah.* This Sufi sub-order is distinguished by peculiar practices derived by Ahmad himself which became the center of attraction for Sufis of this sub-order. The *silsilah* spread over Egypt, Syria, Damascus and Anatolia. Later on in Syria the *silsilah* was divided into Sadiyya or Jibawiyya. Of course it also spread in South Asia.

10. **Madariya** – It is believed that Badiuddin Shah Madar, a Jew, was the founder of this order. His father Abu Ishaq Shami claimed his descent from Aaron, brother of Moses. One night he dreamt of Moses telling him that he would have a son with a dignity of Sainthood. Since his youth Madar had an aura of Sainthood and is reported to have performed a number of miracles. Badiuddin Madar came to India to visit Ajmer and from there he proceeded to Kanpur and reached Manakpur. He had a long life and his Dargah is in Manakpur.

11. **Madaniya** – This sub-order was founded by Abu Madyan Shuaib ibn Al Hussain who died in 1198. It has a sub-order called Shaziliyya *silsilah*.

12. **Jahaniya** – The sub-order was founded by Makhdum Jahaniyan Syed Jalal Bukhari. The Sufis of this Shii sect shave all the hair of their body from toe to head. They wander naked from place to place and swallow snakes and scorpions. They believe that snakes are Hazrat Ali's (R.A.) fish and scorpions are Hazrat Ali's (R.A.) prawns.

13. **Jabariya** – Established by Jahm ibn Safwan, this school taught Sufi*s* that man is not responsible for any of his actions but they are preceded entirely from Allah.

14. **Uwaisiyya** – Those Sufi*s* who claim themselves to be mystically initiated by God are called Uwaisiyya.The term is derived from the name of Prophet Muhammed (SAS) as Uways-al-Qarani.

15. Shattariya – The word *`shattar'* means speed, therefore, the sub-order claims speedy approach to the state of *fana* (annihilation) and *baqa* (subsistence). The Shattariya sect was founded by a descendant of Sheikh Shihabuddin Suhrawardi, who was the initiator of Suharawadi order of mysticism. The name of the founder was Sheikh Abdullah Shattari and as instructed by his *Pir* he came to India during the reign of Sultan Ibrahim Sharqi and settled in Jaunpur and is buried there.

Conclusion

Admittedly, the study of Sufi *silsilahs* is extremely complex. More specifically their origin, characteristics and diffusion involve debates and difference of opinion among the scholars exists. Despite having numerous shortcomings inherent in such studies, we have tried to present a brief sketch of Sufi *silsilahs* in South Asia. Of course, it is concerned mostly, not exclusively, with those *silsilahs* that entered or developed in South Asia. Nevertheless, the study may lead to intensive study of individual *silsilahs*, their parent Dargahs, evolution and distributions, rituals, inter–linkages with other *silsilahs* and Dargahs and their role in social harmony in the society. It is amply demonstrated that the study of *silsilahs*, having based on basic geographical concepts, is a fruitful area of research. We seriously wish that not only the scholars in allied fields but also geographers would realize its importance.

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The Sacred Landscape Of Dargah Hazrat Nizamuddin Auliya : A Geographical Interpretation

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Introduction

The cultural landscape may be classified into sacred and profane. The sacred landscape includes sites for religious ceremonies and rituals performed by the believers, whereas profane landscape includes those which are concerned with everyday life e.g. homes, fields and farms. The mental division between the sacred and the profane is a fundamental aspect of cognitive constructions of a cultural or physical world. The sacred-profane dichotomy is reflected in cultural perceptions of landscape and dictates a number of activities related to the space (Eliade, M. 1959:1-20).

A prominent part of cultural landscape is the sacred landscape created by different cultural groups in their own area of occupation of earth surface. It is not necessarily based on natural phenomenon but is culturally constructed. As Sauer appropriately points out that the significance to a specific configuration of geographical features is not a self-evident fact conferred by Nature or natural processes, but rather a cultural appraisal (Sauer, C.O. 1952: 2-3).

The terms space, place and landscape, sometimes mistaken as the same, have their own connotations. Space is a continuous area or expanse, bounded or unbounded, which may or may not contain objects. On the other hand place is a specifically defined area for a definite purpose. In other words when space is provided with some attributes it becomes a place (Singh & Khan, 1999: 269-278).

Having defined the meaning of these terms let us have a glance over them if we add sacred as an adjective to them. Sacred is essentially the object of veneration and awe. Apartness, other worldliness, orderliness and wholeness are the qualities in defining what is 'Sacred' (Tuan, Yi.Fu. 1991: 684). In this context it may be pointed out that sacred space in contrast to the profane space, does not exist naturally, but is assigned identity as man defines, limits and characterizes it through his culture, experience and goals. Sacred space is essentially related with a religious community. Sacred spaces of each religion attract pilgrims, protect specific areas and serve as symbols of the religion. Sacred landscapes not only represent the present but are also continuation of the past. There can be different sacred landscapes like caves, religious sanctuaries, clay sources, forests, groves, rocks and burial sites (Carmichael, L.D. et al. 1994: 11). Scared landscapes like churches, temples or masjids provide the imprint of religion on an area. Some signs and symbols are related to a particular religion, which give a special and unique identity to the sacred landscape (Park, C.C. 1994: 197-244).

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Granting that there are sacred places affiliated to each religion but there are some places which transcend this barrier. In this context Dargahs of Sufi saints acquire a unique place. They are considered sacred by people of all religions. One of the most prominent characteristics of sacred landscape is the symbolism. Since we have already discussed the symbolism of Dargah Hazrat Nizamuddin elsewhere (Akhtar, Z. & Khan, M. 2011: 1-15) we are concerned here only with the sacred landscape.

Sufism represents the inward side of Islam. It may be described as the mystical (having a secret meaning beyond ordinary human understanding) dimension of Islam. The Sufi is one who attempts to achieve a development of his intuitive faculties through ascetic exercises, contemplation, renunciation and self-denial in order to attain communion with God. Moreover, the philosophy of Sufism gave meaning and mission to the religious feelings and beliefs of a wide cross-section of society.

There is a debate in cultural geography about the authorship of cultural landscape (Duncan, J. S. 1980: 181). "But Hindu religious texts do not leave the question of authorship open for disputation. They provide definite names of persons both divine and human, who have played significant role in the creation of religious landscape" (Singh, J.P. and Khan, M. 2002: 31). The same may be equally true in case of the sacred landscape of Dargahs (Nizami, A.R. 2010; Akhtar, Z. 2011; Akhtar, Z. & Khan, M. 2011). Sufi Saints through their pious life, acts of benevolence and unselfish behaviour have given these places a distinct sacredness.

Objective of the study

The main objective of the study is to describe the sacred landscape of the Dargah Hazrat Nizamuddin Auliya, that present a significant feature in the sacred topography of South Asia. Since Muslim sacred places have been more or less neglected in Indian geographical literature, this study, therefore, tries to fill this gap.

Significance of the study

The present study derives its significance in addressing the following relevant issues: Firstly, since all the major religions in South Asia have their own sacred places and associated landscapes, Dargahs on the other hand are basically multi-religious in nature. Their sacredness transcends the barriers of religion, caste, color and gender. Secondly, there can be no two opinions about the profound impact of the pilgrimage on the life of the people. Sufi Dargahs are a living force in the life of the masses. Dargahs have historically been part of the nation building process and acted as a connecting force in the diversified social reality of the country. Even in the present day scenario of distrust among various sections of the Indian society, culminating in conflicts and communal riots in the country, dargahs can still act as a cementing force. This study, therefore, would try to emphasize the inclusive aspects of sacred landscape and thus reinforce the communal harmony in India.

Data and Method

The study is based largely on historical material available in the literature. However, because of lack of unanimity among the scholars about the person and/or date of construction of various monuments we are unable to describe their historical evolution. Nevertheless, we have also followed the tradition of cultural geography wherein an insightful observation is an inherent part of the collection of information for conducting research. We have frequently visited the Dargah of Hazrat Nizamuddin Auliya, taken photographs and as participant observer gained sufficient knowledge about it.

Conceptual Background

The concept of sacredness of a place is intrinsically related with the human mind. It is basically a human construct which provides it a distinct identity. Moreover, sacredness of a place evolves during a long period. In some instances, it is an outcome of the relation of a highly spiritual person with a particular place or territory. On the other hand, sometimes an individual having intimate relationship with an existing sacred place may himself/herself acquire a sort of sacredness.

Understanding a place or landscape is not a matter of finding a typical 'cultural area', but of seeing how landscapes come to mean different things to different people and how their meanings change and are contested (Crang, M. 1998: 40). Sometimes these landscapes are artificially constructed and utilized for ulterior political purposes.

Space and place are intimately associated with the discipline of geography. Nevertheless, the concept of sacred space and its symbolism has become a fascinating area of research in various disciplines (Barbara, A.W. 1996, Kedar, B. Z. and Werblowsky, R.J. Zwi 1998, Carmichael, D. 1994, Jannie, S. and Paul, S. H. 2001, Lewis, W. 2005, Nasr, S.H. 1993, Pascal, B. 1993, Sinha, A. 2006). Geographers have also started taking interest in this field (Bhardwaj, S.M. 1973, Cosgrove, D.E. 1984, Daniels, S. 1998, Kong, L. 1993, Park, C.C. 1994, Rowntree, L.B. and Konkey, M. W. 1980, Sopher, D.E. 1968, Weightman, B.A. 1996). However, with few exceptions, Indian geographers are still lagging behind in this promising area of research (Singh, J.P. and Khan, M. 2000; Khan, M. and Nizami, A.R. 2011).

Sacred place and pilgrimage has acquired a prominent place in the study of cultural geography of India. A large number of scholars in the allied fields have produced a voluminous literature on the sacred places of Hindus and their pilgrimage. A substantial volume of literature has also been produced by geographers both Indian and foreigners (Bhardwaj, S.M. 1973, 1998; Singh, J.P. and Khan, M. 2002; Singh, R.P.B. and Singh, R.S. 2008; Sopher, D.E. 1968; and Stoddard, R.H. 1968). Surprisingly Indian geographers have almost entirely neglected the vitally important field of places of Muslim pilgrimage. Herein lies the significance of this study, which is part of a broader project to develop geography of Dargahs (Akhtar, Z. 2011; Nizami, A.R.

2010, 2015; Khan, M. and Akhtar, Z. 2009; Khan, M. and Nizami, A.R. 2008; Khan, M. and Nizami, A.R. 2011; Nizami, A.R. and Khan, M. 2011).

The Sacred Ambience of Dargah

The Dargah of Hazrat Nizamuddin Auliya (Plate 1) is one of the most sacred places in Delhi. Besides the sanctum sanctorium, the entire complex acquires sacredness because of its being associated with the life and activities of the Shaikh. Since it is being frequented by the pilgrims or devotees who go there for the wish fulfillment, it is but natural that they consider it the most auspicious and sacred. The Dargah is jammed with people throughout the year. From whichever road you enter, the entire area presents an ambience of piety and sacredness. Before entering, the main complex one may observe the shops selling items either related to perform the rituals at Dargah or any other item, which pilgrims may purchase. While coming to dargah people purchase, flowers, caps, perfumes, joss sticks. By purchasing these items, a pilgrim feels himself fully prepared to enter the Dargah with his offerings. Everyone feels obsessed with the process of entering a sacred space to present his offerings to the Sufi saint. Before entering the complex, everyone has to remove his shoes and cover his head to pay respect to the Shaikh. But when one enters the gate of the complex, the ambience is totally transformed. Irrespective of the religion, caste, colour, gender and age everyone is free to come here and place his wishes before the Shaikh. Every pilgrim thinks only about the Shaikh and his/her own wishes.

Plate 1: Dargah Hazrat Nizamuddin Auliya

While entering from the south gate one reaches first at the Dargah of Hazrat Amir Khusro, one of the most affectionate disciple of Hazrat Nizamuddin. Its ambience provides to the pilgrims a sense of calm, peace and sacredness. Being present near the main dargah, it is considered sacred by the devotees. Following the custom of Sufi shrines, wherein, before going to the dargah one

should first visit the Dargah of Shaikh's disciple. Having paid their respect and offerings at the Dargah of Amir Khusro (the disciple of Hazrat Nizamuddin), they move towards the dargah of Hazrat Nizamuddin. This is the most sacred part of the entire complex and pilgrims feel an entirely blissful ambience there. The devotees feel the peace and tranquility to see the building of tomb as if they are watching the Shaikh itself. This feeling cannot be explained in words. Some people even start weeping as they try to make the Shaikh understand their pain and sorrow. They behave, as the Shaikh is alive and can listen and understand their problems.

The behavior of pilgrims and the rituals followed by them often vary according to their own beliefs and traditions. Some of the devotees lit the candles and joss sticks in a corner, others kiss the feet of the dargah to show their respect. Some pilgrims recite verses of Quran and offer prayers for the soul of the Shaikh. Women do all this from outside the main sanctum sanctorium and can see the grave only from the screens. They also circumambulate the Dargah from outside and tie the thread for wish fulfillment.

Just adjoining the Dargah of Hazrat Nizamuddin Auliya, a grand masjid is situated which is considered a sacred place for the pilgrims. After paying their homage to the pir, devotees flock to this building which symbolizes the sacredness. Some of the Muslim devotees go to this masjid to offer prayers at *namaz* time.

The overall environment of the place gives a sense of calmness in the heart. The Dargah complex is full of graves, which were built after the demise of the Shaikh. The Dargah is considered so sacred that people of royal families, nobles and *Khadims* wished to be buried in the complex so that they are benefitted from the presence of Shaikh's Dargah near them. The overall environment there is like a graveyard, which fills a sense of respect and obedience towards the dead persons.

The other important sacred monument which attracts the pilgrims is the *Baoli* (step well). It acquires a sense of sacredness because its water was used by the Shaikh himself for his ablutions and it was he who was responsible for its construction. The water of the *Baoli* for a devotee has a supernatural power to wash their sins. Moreover, for the devotees the water of '*kundis'* (chain) in the *Baoli* is considered sacred and used for curing a number of diseases.

The Sacred Complex of Dargah Hazrat Nizamuddin Auliya

Dargah of Hazrat Nizamuddin consists of a large complex having a number of monuments. However, it would be interesting to have a look at the sacred complex and its surroundings. In this context, it needs emphasis that at times a single monument has undergone substantial changes in its structure and architecture.

Khanqah* and *Chillah: When Shaikh Nizamuddin Auliya settled at Ghiyaspur, after a hardship of 11 years in 670 A.H., his *Khanqah* (Plate 2) emerged as the main centre of Chishtiya mystic activity in northern India. Parenthetically it may be pointed out that he shifted to various places in Delhi from 659 to 670 A.H. (Nizami, K.H. 1941: 266-267). Situated on the banks of river

Yamuna it initially comprised a thatched structure of mud. But, after sometime, his disciple Ziyauddin Wakil a clerk, succeeded in obtaining Hazrat Nizamuddin's permission for constructing a structure of brick and mortar (Khurd, A.1978: 147; Hussaini, S.M.A.1936: 234). The *Khanqah* comprised a big hall (*Jamat Khanah*) in the centre, with pillars (*suffah sutun*) on its sides. It is a three-storey building. On ground, a veranda surrounded the courtyard, but in order to provide separate rooms for some senior inmates, the parts of the verandah adjoining the hall were walled up. Opposite to the main gate was the gate room *(dehliz*) with a door on either side. This was a large room and a few men could sit there comfortably without obstructing the passage of others. Adjoining the *dehliz* was a kitchen (Nizami, K.A.1991: 57).

The Shaikh lived on the first floor in a small room of wooden walls on the roof of the hall. During the day, he had his rest in one of the small rooms in the main building (Khurd, A.1978:281). A low wall ran around the roof, but on the side of the courtyard, the wall was raised higher to provide shade for the Shaikh and his visitors when they sat talking in the morning hours. Hazrat Nizamuddin died in this building in his room. ASI had taken this building in its charge as the building was in a very bad condition and needed renovation (Nizami, K.H.1941:266-267).

Plate 2: *Khanqah* and *Chillah*HazratNizamuddin

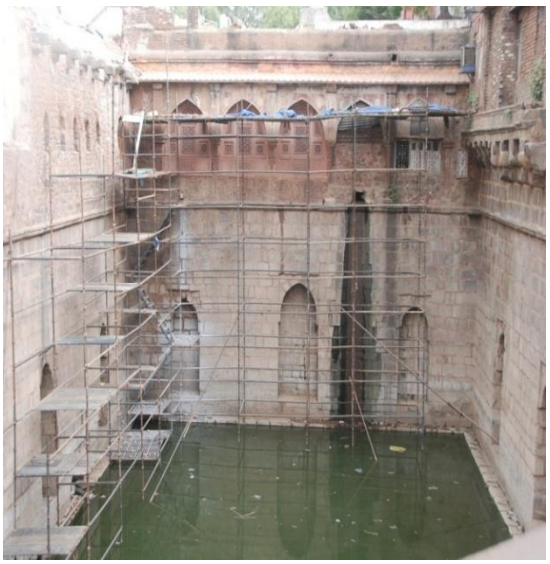

Plate 3: *Baoli* Dargah Hazrat Nizamuddin

Baoli: The *Baoli*, (step-well) named '*Chashma-e-dilkusha*' (the Heart-alluring spring) was the only construction done personally by Hazrat Nizamuddin and his disciples (Plate 3). But there is difference of opinion among the scholars regarding the date of construction and the reign of the emperor at that time. While H.C.Fanshawe gives year of 713 A.H./1312 A.D., which corresponds

with the era of Alauddin Khilji (Gupta, N. 1986: 112-113; Fanshawe, H.C.1998:237-238)[1].The scholars like Dhaul (2006:74) and Gupta (1986:237-238) have given the name of Ghiyasuddin Tughluq as the period of construction of *Baoli*. Similarly, Khwaja Hasan Nizami Dehlevi also believes that it was constructed during the reign of Sultan Ghiyasuddin Tughluq in 703 A.H.(1941:237-245). Syed-ul-Hujjab Khwaja Maruf, a *nazim* and confidant of Feroz Shah Tughluq constructed a *chhatta* (ceiling on a corridor) over the *Baoli* (Afif,S.S. 1889-91:445-451; Nizami, K.A.1991:199). Nowadays, the ASI is doing the job of renovating the *Baoli* structure.

The Sanctum Sanctorium: The most important place in the complex–the sanctum sanctorium, has undergone changes over a long period of time (Plate 1). It has been claimed that the grave in the present enclosure was initially a room with walls of latticework surmounted by a masonry dome (Tughluq, F.S.1941: 17). On the other hand Amir Khurd points out that Mohd. Tughlaq constructed a dome over the grave of the Shaikh Z(1978: 154).Later on Feroz Shah Tughluq (1351-1388) repaired the doors, the dome and the latticework of the tomb, which were earlier made up of sandalwood. He also hanged up the golden cups with chains of gold in the four recess of the dome (Nizami, K.A.1991:197-198). In 970 A.H./1562 A.D. Syed Faridun, Khan put up the marble screens under the dome and a marble slab with an inscription at the head of the grave.

Farid Khan also known as Murtaza Khan made an offering of wooden canopy inlaid with mother-o-pearl in the reign of Jahangir, which had an inscription of 1017/1608. In 1063/1653 A.D. Khalil-ullah Khan, a noble of the court of Shah Jahan, built verandah of red sandstone, and a *ghulam gardish* (shed for servants to sit), pillars around the grave and put up inscriptions over two of its arches. The marble flooring of the entire area was done by Mohammad Shah.

In 1169A.H./1755, A.D. Alamgir II put up inscriptions on marble inside the dome. In 1236A.H./1820, A.D. Faizullah Khan Bangash covered the ceiling of the verandah having 20 pillars with copper gilt and ornamented it with blue enamel. In the year, 1239 A.H./1823 A.D. Akbar II removed the masonry dome and replaced it with marble topped with a copper gilt pinnacle. According to Laxmi Dhaul Akbar Shah II added a golden cupola in 1239/1823. Nawab Ahmad Bakhsh Khan Bahadur changed red sandstone pillars of *baradari* with marble pillars in 1242/1826. In 1300/1882A.D. Khurshid Jah of Hyderabad put up a railing of marble (Nizami, K.A.1991:197-201). Moreover, it may be pointed out that the Dargah complex has two separate gates. Besides, from the side of *Baoli* the other from Nizamuddin Basti bears the date of 1378 A.D. Both of them were built by the emperor Feroz Shah Tughluq.

***Jamat Khanah* Masjid:** The *Jamat Khanah* Masjid (**Plate 4**) also known as Khizri Masjid is a fine example of Pathan architecture. Parenthetically it may be pointed out that *Jamat Khanah* built by Chisty Shaikhs was a large room where all the disciples slept, prayed and studied on the

1. Khwaja Hasan Nizami mentions 703 A.H. as the year of the construction of the Baoli.

floor (Nizami, K. A. 1961: 175). There is a difference of opinion regarding the construction of this masjid. The scholars like Fanshawe,H.C. (1998:238-239) and Khwaja Hasan Nizami (1941:353) gives the name of Khizr Khan (the son of Alauddin Khilji) for constructing this mosque. However, K.A.Nizami and Narayani Gupta emphasize the name of Firoz Shah Tughluq.K.A. Nizami, emphasizes that the *Jamat Khanah* is hardly a few feet from the building of the dargah. Had the structure been there at that time a new *Jamaat Khanah* such as had not existed there before, was built (1991: 198). However, Sir Syed Ahmad Khan is the only author who says that it was built in 754 A.H./1353 A.D. by Firoz Shah Tughluq (1986: 112).

Plate 4: *Jamat Khanah* Masjid

Amir Khusro's Tomb: Abul Hasan popularly known as Amir Khusro was the most renowned poet of India and the cherished disciple of Hazrat Nizamuddin Auliya. He died in 725 A.H./1325 A.D. about six months after the death of Hazrat Nizamuddin Auliya. The tomb of Amir Khusro (**Plate 5**) is located in the Dargah complex itself just south of the main

Plate 5 : Dargah Hazrat Amir Khusro

Dargah. Shihabuddin Ahmad Khan, a nobleman from the Akbar's court erected a dome with latticed walls of red sandstone over the grave in 1561-62. However, the present tomb was built in 1014 A.H./1605 A.D. by Ahmaduddin Hasan in the reign of Jahangir (Gupta, N. 1986:115-116).

Earlier the Dargah of Amir Khusro was connected to the enclosure of Hazrat Nizamuddin on the north by an arched doorway, which was closed later on. The main entrance to Amir Khusro's enclosure is through a gateway on the east, which was rebuilt by the Nizam of Hyderabad in the year 1881 A.D. The enclosing wall of the Dargah was constructed by Mehdi Khwaja.

Graves inside the Main Complex: South of the tomb of the Shaikh comes the graves of many persons of note, and amongst them not a few of royal blood, resting as close as possible to Hazrat Nizamuddin. Among these in one enclosure (20 feet by 16 feet) lie the graves of Mirza Jahangir and prince Balban. In the next enclosure (20feet by 16 feet) on the east lies the graves of emperor Mohammad Shah (d.1748) (Fanshawe, H.C.1998:240) his wife, and Nadir Shah's son and his infant daughter. The walls of the enclosure are 8 feet high, and its four corners are ornamented with small marble minarets, the door, and the panel opposite to it is surmounted with the same style of ornament. The walls consist of panels of marble latticework, and in the middle panel of the front wall is the door with folds of marble.

Another marble enclosure contains the grave of Jahanara Begum, the daughter of Shah Jahan (d.1092 A.H./1681 A.D.) who built her tomb in her own lifetime. Her grave is covered by a casket shaped marble monument hollowed at the top to expose to sky. The four corners of the enclosure were surmounted by small marble minarets, out of which only two are in existence today. On the right of the grave of Jahanara is that of Mirza Nili, the son of the emperor Shah Alam and on its left that of Jamal-un-Nissa the daughter of Akbar II.

Urs Mahal: In the midway towards Dargah, on the left side a gateway goes to a compound of *Urs Mahal* (**Plate 6**) which was inaugurated by the late former Indian president Dr. Radhakrishnan in 1962. Keeping in view the security of VIP's who visit the Dargah during the *urs*, the celebrations are organized in the *Urs Mahal*. It has a large open area in which *shamianas* or tents can be arrangeduring the *urs* (Dhaul, L.2006:52-53).

Plate 6: ***Urs Mahal***

The other important buildings in the vicinity of the Dargah are following–*Shama Burj*, Barah *Khamba*, *Lal Mahal*, *Tablighi Markaz* and mosque, *Chaunsath Khambe* (built in 1623-24 A.D.), Ghalib Academy (built in 1969 A.D.), Ghalib Tomb, *Bari ka Gumbad*, Khanqah Mirza Behram Shah, Maqbara Atga Khan, Old Langar Khana, *Nal Wali Masjid*, *Mashaikh Masjid*, Graves of Nawab of Loharu's family, Graves of Kirmani Family, Graves of disciples of Hazrat Nizamuddin, Old graveyard, *Arab Sarai*, *Mandi Arab Sarai*, *Maqbara* Isa Khan, *Haleema ka Bagh*, Azim Ganj, Humayun Tomb, *Chilla Sharif*, *Neela Burj* (*Maqbara* Mirza Faheem) and *Batashae Ka Mahal* (Nizami,K.H.1941:178,195,205-206).

Concluding Remarks

On the basis of above we can fairly conclude that the Dargah of Hazrat Nizamuddin occupies a distinct place in the sacred topography of Delhi. It is a major pilgrimage site of North India. Since we have already discussed earlier (Akhtar, Z. & Khan, M. 2011) the symbolism associated with this dargah we have confined ourselves only to the description of sacred landscape of the Dargah. The sacred monuments in and around dargah complex have been preserved, modified and landscaped over the time, thus emphasizing the fact that they are not static but change over time. The sacred complex has created a sense of peace and tranquility amongst its devotees. The sacredness of the Dargah represents its power to attract pilgrims throughout the year from all parts of the country and beyond. The role of Dargah Hazrat Nizamuddin Auliya along with other Dargahs cannot be underestimated for the social integration of the Indian society.

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Analyzing the vulnerability of Odisha Coastal Zone to Severe Cyclonic Storms

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Abstract

The 21st century so far is marked by series of devastating extreme events causing extensive human and economic losses along the coastline in developing countries. Meanwhile changing climate and developmental pressures increase the chances of biophysical changes in the natural coastal environment and potentially introduce an escalation in ecosystem risks which are difficult to predict. In light of rapid rate of such changes with high amount of scientific uncertainty to map the foreseeable future fosters to develop a method for assessment of coastal vulnerability, to have a sense of risk and to categorize the conflicts, collision and interaction in coastal system on a relative scale. While most scientific assessment of such risks focused on the anatomy of conceivable biophysical changes with little attention toward socio-ecological changes that might endanger the coastal systems. The purpose of the research paper is to develop method and test Integrated Coastal Vulnerability Index (ICVI) to severe cyclonic storms in fragile coastal zone of developing countries and to help coastal managers to identify risks, value and hazard of coastal ecosystem. Taking 480 km coastlines of Odisha as an example, the study examined all fundamental vulnerability factors i.e. hazard, exposure, coping ability and the impacts indicators are aggregated to map composite vulnerability index to identify the zones of relative risks. ICVI is the first such study in Indian coast to provide a valuable preliminary tool to guide coastal managers in the absence of more comprehensive assessments for large coastal regions. The absence of detail data at various scale impose limits for development of indices. This investigation will further allow direction for more resources in developing countries to have detail investigation of the most fragile coastal ecosystems.

Keywords: Coastal zone, vulnerability assessment, composite index, relative risks and sustainable , dynamic coastal systems

1.Introduction

The coastal ecosystems are most productive complex of multi-function systems and yet highly endangered ecosystem of the world with conflict of interest and challenges surrounding the use to different type of natural hazards. For generation, cyclonic storms and storm surge are the cause of devastation of population and infrastructure and management of coastal resources (**1- 3**).
According to estimate, more than half of the global population live in coastal zone that accounts for approximately 10-29% of the earth's land mass **(4 – 6).** Collectively this place has attracted

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population from inland worldwide and also exposed in coastal zone of developing countries. Furthermore, increase in anthropogenic developmental pressure, projected rise of sea level and accelerate climate change will decrease the natural functioning of coastal system with disturbing impact in low lying countries of the world **(7 – 10) .** This pressure is exuberated by extreme weather events, climate induced natural disaster, sea level rise, ocean acidification and human-induced drivers linked to population, economic growth, and related land-use change**s (11, 12).** Present alarming estimate byIntergovernmental Panel on Climate Change Fifth Assessment Report (AR5), projected that the global climate will warm by around 0.85 degrees Celsius since 1880 with the fastest rate of warming in the Arctic and projected sea level rise of 0.26-0.55 meters (10-22 inches) by 2100 under a low emissions scenario and 0.52-0.98 meters (20-39 inches) under the high emissions scenario **(13).** The catastrophic super cyclone that ravaged Odisha in October 1999 and the devastating Indian Ocean Tsunami in December, 2004 has raised the concern of coastal policy maker in India and forced for scientific assessment of natural hazard, coastal processes and vulnerability of the region. In this context, accurate information about coastal vulnerability will enable policy maker and resource managers to anticipate the impacts due to extreme events and also help to prioritize the management efforts to alleviate the possible consequences. Coastal vulnerability is, therefore, central to the concept of Integrated Coastal Zone Management (ICZM) has risen to prominence and as such has been signaled as core to India's federal governments' intention of developing ICZM preparedness in the 21st century. The energetic environmental actions (storms, waves, tides, winds and currents) along with conflict and collision of interest and challenges of coastal system have resulted in scientific consciousness to develop holistic integrated approach to deal with coastal vulnerability by incorporating the concept of susceptibility (potential of system to be affected), sensitivity (responsiveness of the system) and resilience (natural ability to bounce back).

Vulnerability as a research topic was frequently cited in disaster literature **(14, 15)** but got international prominence after playing central role in the preparation of the World Coast Conference 1993 and several IPCC reports **(16, 17)**. These global vulnerability assessments were used extensively for analysis of risks and threats with an intention of providing accurate information to coastal managers as an ingredient of policy making process. Furthermore, these coastal vulnerability assessments were primarily depend upon simulation and forecasts for predicting future variability in coastal ecosystem but they are limited in capacity to explain the local and regional impacts. The limitation were in form of simple assumption, average global data, low spatial resolution, time consuming processing and more focus in physical vulnerability with exclusion of socio-economical aspects **(ibid 17, 18).** Unless the computed outputs are down scaled and refined then it's of little use for decision maker at local and regional level. Further, there is highlight for developing methods adjusted with local site to assess and analyze the vulnerability of coastal systems to manage the potential loss and promote sustainable development. In doing so, the degree of developmental pressure can be checked by natural

coastal behavior and also help in defining coastal vulnerability to identify adaptive action modifying natural responses in coastal system to ease the consequences(**19).** As result of these limitations, the coastal managers facing challenges providing updated user friendly accurate information to end users about coastal vulnerability. The first difficulty of availability of high resolution data, scenarios, integrated models from disciplines such as geography, geology, territorial planning, social science and engineering sciences need more holistic approach for integration for vulnerability assessment. The other challenges faced by scientific world is to communicate the computed output in user friendly language for engaging local population for actions in local scale by modifying their adaptation strategies. The purpose of the research article is to develop and test Integrated Coastal Vulnerability Index of the 480 km of Odisha coastline that segregate the portion of coast zone into relative pre-defined vulnerability classes. This assessment identifies hazard, exposure and adaptive capacities of the coastal zones and aggregation for developing composite index. The other important component included in the analysis is actual impacts of extreme events in assessing the vulnerability to coastal hazards as a way of using a directly observable quantity to calibrate the hazard and exposure combination and anchor it in terms of outcomes that matter. Hence, coastal vulnerability is defined as the potential factor of a coastal system to be harmed. This assessment should let coastal policy makers to anticipate potential damages along the coast to a given agent (or combination of them) and to decide where to concentrate efforts in preventing, fighting or counteracting their consequences.

2.Previous Work

The framework and methodology of coastal vulnerability assessments were driven by IPCC report and become part of academic analysis and research for coastal policy makers **(20-22)**. These documents not only provided refined framework for assessing coastal vulnerability but also raise the awareness about possible impact of climate change and consequences in coastal zones. Further, these frameworks were refined and integrated in conventional coastal zone impact assessment for broadening the vulnerability research **(23–25)**. Vulnerability assessment is an estimate of the level of loss or damage resulted from an extreme event of given severity, including damage to structures, personal injuries, and interruption of socio-economic activities. Gornitz was the first to develop coastal vulnerability index (CVI) to study the impact of sea level rise for east coast of the United States using variables like geomorphology, coastal slope, rate of relative sea-level rise, rate of shoreline erosion/accretion, mean tide range and mean significant wave height **(26**). Variants of the Gornitz's original CVI were modified and adjusted to regional scale but all of these assessments maintain the essence of methodology; to rank and quantify vulnerability along the coastline **(27– 29).**

Various approaches were used by researcher of India in defining vulnerability and much of works were on biophysical perspective that is a combination of physical exposure and residual impacts. Sea level scenarios were used for mapping the coastal vulnerability of Cochin, southwest

coast of India and conclude that climate change will have adverse impact in sea level rise **(30).** Another group of researcher estimated coastal vulnerability index of Mangalore coast, India, from Talapady to Surathkal to analyze the relative vulnerability of various segments of Manglore coastline to erosion hazards **(31).** Furthermore there was attempt to calculate for Udupi coastal zone of Karnataka using variables like shore-line change rate, sea-level change rate, coastal slope, mean tidal range, coastal geomorphology **(32).** The first scientific assessment were used to construct CVI using bio-physical indicators like shore-line change rate, sea-level change rate, coastal slope, significant wave height, tidal range, coastal regional elevation, and coastal geomorphology and tsunami run-up mapping the relative vulnerability of the study area **(ibid 12).** While majority of studies **(33-37)** were intended to amalgamate, refine and upscale the coastal vulnerability assessments and to develop standardize data set as criteria applied for analysis in global, regional and local scale. However, none have tried to develop integrated coastal vulnerability assessment of coastal environment affected by severe cyclones in the study area.

3.Material and Methods

The term 'vulnerability' possesses a plethora of definitions, the output are used by wide range of academia, policy makers and resource managers from different backgrounds. In this sense, coastal vulnerability may be expressed in mathematical function of hazard, exposure and adaptive (coping) capacity of the system **(41- 44).** The most common form of coastal vulnerability assessment are construction of an 'index', a methodology of aggregating of simplified number of complex and interacting processes, derived from by diverse data types, to form a composite number readily understood and therefore has greater utility as a management tool' (**ibid 29).** In this paper, eight key variables have been grouped together under four conditions; hazard, exposure, impact and coping ability. This grouping was determined based onpanel of relevant experts as the most important with regards to vulnerability in Odisha coast (Figure 1).

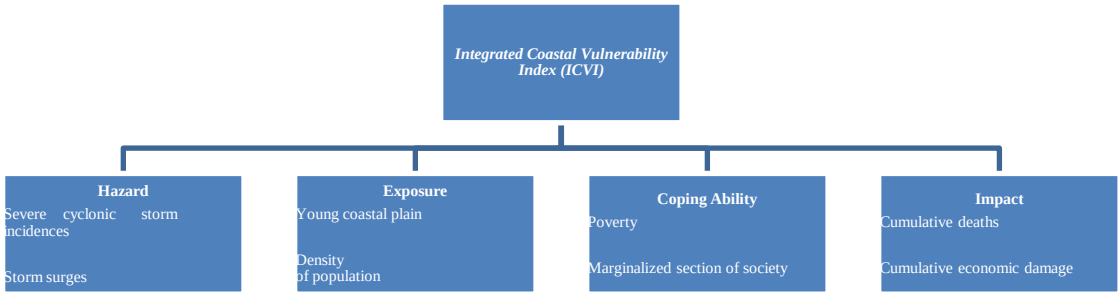

Figure 1: Distribution of variables into four conditions in constructing ICVI

The method of computing ICVI used in the present study is similar to used by Shaw et al., Thieler & Hammar-Klose , Briguglio, Kumar, Well, UNDP,Abuodha and Woodroffe and Ozyurt & Ergin **(45 - 50, ibid 29, 36)**. Since the components of the index are often measured in different units, the observations have to be 'standardized' or 'normalized' to permit averaging, with the average being called a composite index. The normalization procedure most commonly used adjusted to the observation taking a value between 0 and 1 using the formula below:

Vij = (Xij - MinXi) / (MaxXi - MinXi)

Where, Vij stands for the standardized observation associated with the i^{th} component for coastal zone j; Xij stands for the value of the i^{th} component in the vulnerability index, for coastal zone j; MaxXi and MinXi stand for the maximum and minimum value of the i^{th} component for all coastal zones of Odisha in the index.

Hazard Index 1 (HI1) = (Max. SCSi−SSi)/ (Max. SCSi−Min. SCSi)
Hazard Index 2 (HI2) = (Max. SSi−SSi)/(Max. SSi−Min. SSi)
Exposure Index 1 (EI1) = (Max. YCPi−YCPi)/(Max. YCPi−Min. YCPi)
Exposure Index 2 (EI2) = (Max. DPi−DPi)/(Max. DPi−Min. DPi)
Coping Ability Index 1 (CAI1) = (Max. BPLi−BPLi)/(Max. BPLi−Min. BPLi)
Coping Ability Index 2 (CAI2) = (Max. MSSi−MSSi)/(Max. MSSi−Min. MSSi)
Impact Index 1(II1) = (Max. CDi−CDi)/(Max. CDi−Min. CDi)
Impact Index 2 (II2) = (Max. CEDi−CEDi)/(Max. CEDi−Min. CEDi)

Where, SCSi (number of severe cyclonic storm incidences) and SSi (the storm surge associated with most severe cyclonic event in coastal zone i) are the hazard indicators for coastal zone I; YCPi (young coastal plain) and DPi (density of population) are the exposure indicators for coastal zone I; BPLi (below poverty line) and MSSi (marginalized section of society) are coping ability indicators; and CDi (cumulative deaths) and CEDi (cumulative economic damage) are the impact indicator for coastal zone.

Finally ICVI index was calculated computed through the average of the eight component values without applying weight and assuming that each parameter contributed equally to the vulnerability of the system.

VI = (HI1 + HI2 + EI1 + EI2 + II1 + II2 + CAI1 + CAI2)/8

Though the scientific delineation of coastline into differential zone of vulnerability seems arbitrary, the design here is not map the definitive prediction but rather to highlight, within study area, the coastal zones which are likely to be affected more severely than others. It does not matter whether you have four or five vulnerability classes, the end result is same; some zone will be in more risk than others. Majority of the indicators are dynamic in nature and require high resolution data bases from different sources for analysis. Some of the data bases are derived from remote sensing, GIS, and numerical model data. Data sets used in this paper are described in detail in next section. This study will be first in kind that undertaken in Indian coast to provide a valuable preliminary tool to guide coastal managers in the absence of more comprehensive assessments for large coastal line like Odisha.

The source of data used for coastal hazard, viz. the occurrence of tropical cyclones, are taken from 1996 publication of India Meteorological Department 'Tracks of Storms and Depressions in the Bay of Bengal and the Arabian Sea', with periodic updates. In this publication, the cyclonic events have been broadly classified into three categories based on wind speed and pressure-Depression (D) with a wind speed of 28–33 km, Storm (S) with a wind speed of 34–47 km and Severe Storm (SS) with a wind speed of 48 km and above. In this investigation, severe storm and storm category of cyclones and occurrence of these extreme events between 1969 - 2001(availability) were taken for analysis The other indicator storm surges above mean sea level are taken from Odisha Storm Surge Project Report, 2002. It was prepared by Indian Institute of Technology, Delhi, Baird and Associates for Odisha State Disaster Management Authority (OSDMA) . The source of data for the exposure indicator, density of population in the sample districts was taken from Census of India, 2001. The source of data on the physical indicator i.e. Young Coastal Plain are interpreted from satellite imagery, existing geomorphic maps, ancillary data and ground verifications.

Table 1. Summary of indicators and source used in study

Components of Vulnerability	**Indicator's Name**	**Description**
Hazard	SCS	The number of severe cyclonic storms in particular zone. The value of SCS range from 2 to 4.
	SS	The maximum probable surge amplitude in meters above mean sea level. The value of SS range from 3 to 8 meters above mean sea level.
Exposure	YCP	The recently formed landforms in coastal zone of Odisha. The value of Young Coastal Plain range from 97.18 to 309.11 Km^2.
	DP	Density of Population. The value of DP ranges from 382 to 637 persons per Km^2.
Coping Ability	BPL	Percentage of families below poverty line. The value of BPL range from 0 to 100 %.
	MSS	Percentage of people belongs to marginalized section of society. The values of MSS range from 0 to 100 %.
Impacts	CD	Cumulative deaths – Total no deaths due to cyclones from period 1969-2001. The values of CD range from 345 to 18453 persons.
	CED	Cumulative economic damage- Total damage covered in terms of money due to coastal hazards from period 1969-2001. The value of CED range from 1123 to 18097 Crores Rupees.

The data regarding indicators of coping ability of coastal community like Below Poverty Line are taken from Department of Panchayatiraj, Government of Odisha and population belonging to marginalized section of the society is also taken from Directorate of Economics & Statistics, Bhubaneshwar, Odisha (2002). The data on impacts (human mortality) is available from 1969 onwards and has been compiled from three sources – the media reports, the Indian Meteorological Department's 'Mausam' journal and the MODs (Memoranda of Damages, which are submitted by the state governments to the central government for getting relief assistance). The economic damage indicators are taken from the Memoranda of Damages produced by Revenue Department, Government of Odisha. Here data given below in Table 1 provides a brief summary of the indicators of different components of vulnerability and their respective sources. This method is particularly useful in developing countries because it is rely upon detail, precise, long term data which are not available and costly to produce.

4.Study Area

The section of the Odisha State littoral zone on the east coast of India is 480 km long and extends from Balasore in the north to Ganjam in the south, (17° 48´-22°34´N to 81°24´-87°29´E) has been selected for the study (Fig. 2). The maritime state Odisha covers an area of 156,000 km^2 and has total population of 36.7 million with 30 districts viz. Balasore, Bhadrak, Kendrapada, Jagatsinghpur, Puri, and Ganjam **(38).** Due to the river systems, the coastal Odisha contains the fertile soil and is best known as the "Rice Bowl" of the State.

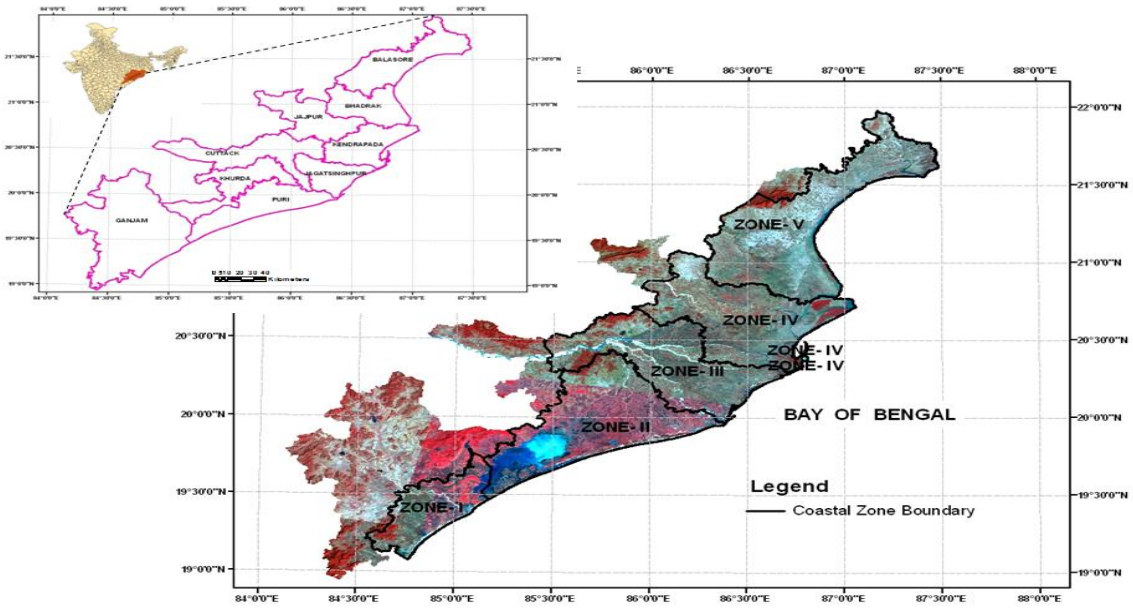

Figure 1: Location of study area (shown in five zones and administrative boundaries)

This region is the most developed part of Odisha state, supporting 36% of the total population and 43% of urban population **(ibid 38**). The study area has strategic international importance and also one of the world heritage sites for tourist and pilgrims. The bountiful coastal area encompasses the unique Chilika lagoon (Asia's largest brackish water lagoons), Bhitrarkanika (India's second largest mangrove forest) one of richest and diverse mangrove ecosystems endowed with largest rookery of Olive Ridely (beach at Gahirmatha). The coastline generally aligns oblique to prevailing winds and waves that generate strong northerly littoral current, the cause for the formation of large compound delta in study area. These deltas consists of a monotonous plain with landforms formed by fluvial, fluvio-marine, aeolian and marine processes.

The long coastline of the state with diverse biological natural resources are having risk from multiple disasters like tropical cyclones, floods, storm surge, tsunami and droughts. The possible threat to multiple hazards has increased many folds by burgeoning population stress, environmental conflicts and increased agricultural and industrial activities. The most damaging oceanographic episode that coastal inhabitants of state can face are cyclones with a combination of wind, waves, storm surge and flood either from Ocean, from rivers or heavy rainfall. The economy of the state are crumbled down because of several natural hazard occur in succession. The coastal districts of Odisha were severely affected by 1999 super cyclone causing massive destruction of life and property. Transformation that appear prominent during the last two decades are loss in coastal vegetations, especially mangrove forest, degraded coastal lagoon ecosystem, decline in mass nesting and high mortality of Olive Rideley turtles, formation of sand spits and shoreline changes near estuaries. The loss of land due to shoreline and sea level changes are now become recurrent phenomena in state. The coastal resources and their apparent changes and threat suggest that the existing conservation measures and management practices are inadequate to protect the vast coast line and coastal resources of Odisha. The need of time is to identify the vulnerable coastal zone and assessment wishes to explore possibilities to maintain the functional integrity of the coastal resources to reduce resource use conflict, to maintain the health of environment and facilitate the progress of multi-sectoral development. This phenomenon of environmental stress, eventually leading to environmental degradation, appears inevitable and is expected to continue unchecked if some short- and long-term measures are not implemented without delay by government of Odisha.

The state government has divided the Odisha coast into five cyclone zone **(39, 40)**. These zones are as follows;

(1) Zone-I: Icchapuram to Chilka mouth (2) Zone-II: Chilka mouth to Devi mouth (3) Zone-III: Devi mouth to Mahanadi mouth (4) Zone-IV: Mahanadi mouth to Dhamara mouth (5) Zone- V: Dhamara mouth to West Bengal border. In the present study, ICVI to sever cyclonic storms were documented for each zone and their changes with time were also monitored.

4. Analysis of the result

The ICVI scores along the study area of Odisha coastline varies from 0.16 to 0.69 with a mean value of 0.41 (Figure 3). Accordingly, zone –III (0.69) considered as most vulnerable, zone – II (.46) considered as highly vulnerable, zone – II considered as moderately vulnerable, zone – V considered as less vulnerable and zone – I considered as least vulnerable zone to extreme events. The result of this investigation showed that vulnerability of study is more correlated with physical process than socio-economic processes and the output has similar pattern of previous assessments **(ibid 12)**.

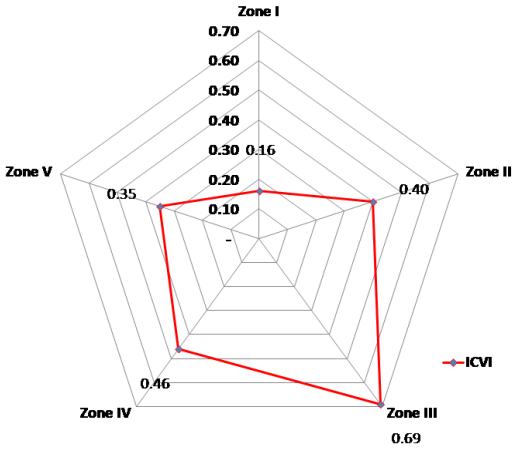

Figure 3: Relative vulnerability score for coastal zones of Odisha

The results of the specific variables used for the construction of ICVI are shown in radar with markers charts (Figure 4). Further, the study revealed that 14 % of Odisha coast (Zone III) has score of very high relative vulnerability, which equate to almost 67 km of Odisha coastline.

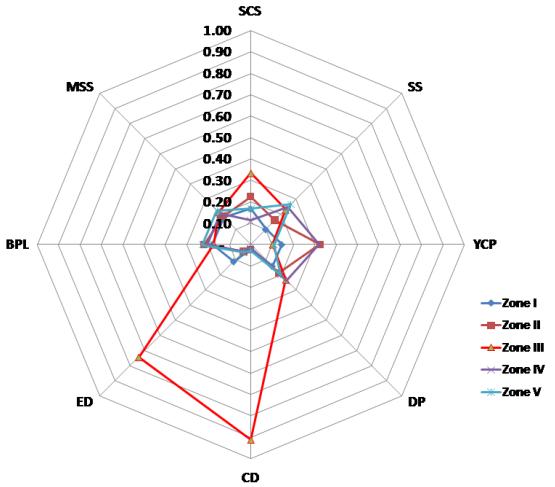

Figure 4: Range of vulnerability scores of individual parameters for the Odisha coast

This is mainly due to high amount cumulative deaths (91% of total CD), economic losses (71 % of total ED) and frequency of severe cyclonic storm (33 % of total SCS). Further, this zone is under severe stress from rapid population growth, urbanization, industrlization, salt water intrusion and heavy floods. The coastal zone-IV is extremely flat and low which is subject to severe cyclonic storms (11 % of total SCS), storm surge (25 % of total SS), floods and associated tidal surges making next highly vulnerable zone of Odisha. It is about 14 % of coast line (68 km) and having relative vulnerability score of 0.46. This was the most devastated zone during 1971 and 1999 cyclone and rapid erosion of turtle nesting ground of Gahirmatha and villages of Satabhaya have drawn attention of researchers, policy makers, international agency and government officials.

The coastal zone-II having largest coastline is the 3rd most vulnerable zone of coastal Odisha. Majority of coastline 32 % (155 km) of Odisha coast having moderate vulnerability score because of high percentage of area exposed to coastal processes (32 % of total YCP), high prevalence of poverty (22 % of total BPL), low casualty and economic damage. The coast of this zone has narrow continental shelf which limit the inshore productivity. The coastal sand dune occur as a linear strip, running parallel to the shoreline, which maintain higher altitude than immediate interior part and hence swamps and tidal inlets are also common in this zone. The coastal zone-V having 2nd largest coast line (27 % total coastline) and 2nd lowest exposed area to coastal process, is in less score of vulnerability index. This zone is most densely populated and most frequently prone to cyclone because of flatness of landmass and funnel shaped structure of the coastline but impact in form of cumulative deaths and economic damage are quite low. The coastal zone -I consisting 13 % of total coastline are level of least vulnerability. Interestingly, the occurrences of hazard component are quite high in this zone but as result high coping ability of coastal inhabitants, the conversion rate in form of cumulative deaths and economic damage are low. Hence, from ecological perspective turtle nesting sites, estuary mouths, spits and other protected areas are under high risk zone in coastal Odisha.

Nevertheless, comparison between result of hazard, exposure, coping ability and impact indicators resulted in construction of ICVI can contribute to understanding the variability in and determinants of vulnerability. As shown in figure 5 and observed in the field work, the area

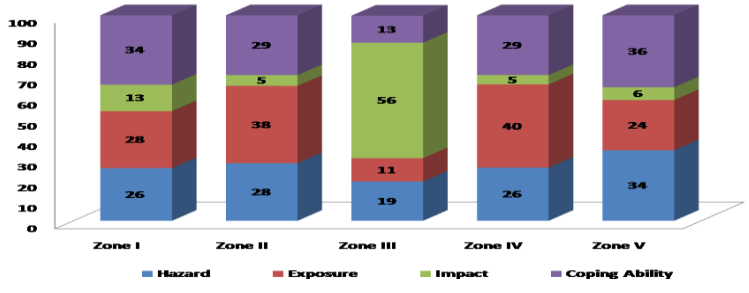

Figure 5 – Proportion of indicators of relative vulnerability of Odisha coast

between Devi mouth to Mahanadi mouth (Zone –III) are having high vulnerability to severe cyclonic storms. This zone is characterized by low percentage of occurrence of hazard but the impacts in form of cumulative death and damage are quite high because of coping ability of inhabitants staying in this zone is low.

However, Zone – IV and Zone - II are rated as high vulnerable and moderately vulnerable area respectively but the impacts are quite low while both the zones having high percentage of occurrence of hazard and exposure unit. In addition, the coping ability of both zones is quite high to absorb the shocks of extreme cyclonic storms.Furthermore, Zone – V and Zone – I are categorized as low and least vulnerable areas of the Odisha coastline to severe cyclonic storms. It can observed from the figure 5 that both the zone are having high percentage of occurrence of hazard, relatively low amount of exposure unit, low amount of losses and coping ability of local population keep these area at bottom of the table on relative vulnerability scores. These kinds of interpretation of vulnerability assessment, the issues of concern for the authorities and decision makers of Odisha are human and property loss, coastal land loss in ecological fragile region, degradation of coastal environment and rapid shoreline changes. Finally, these kind of assessments can help policy makers in assessing the conversion rate of hazard to impacts emerged as result of severe cyclonic storms and help coastal managers to prioritize the effort to minimize the possible consequences.

5.Discussion

The sensitivity of the coastal region to extreme events was assessed through extensive iterative evaluation of 10 physical and socio-economic parameters. These indicators were used to calculate ICVI by giving equal weightage when they operated synergistically. This kind of vulnerability mapping does not provide a high-confidence or high-resolution determination of the vulnerability of particular coast but rather it provides a rapid precautionary assessment which serves to highlight coastal areas likely to be impacted to some degree by coastal hazards. Indicator and indexed based approach are not absolute mapping of vulnerability but simple to implement and provide relative assessment. The composite index of ICVI is useful tools for scoping or first look assessment for coastal managers to identify the priority vulnerable coastal zone. The simplified approach is also useful for communicative purpose but may not support more detail quantitative coastal vulnerability assessment and identification of adaptation strategies. These assessments advocate that there are many opportunities to reduce the impact of sever cyclonic storms by improving the resilience of vulnerable area and better prepared for future extreme weather events in the state. On other hand there are number of further drivers and processes that play relevant role in construction of coastal vulnerability which are not included in ICVI due to constraints in availability data, resources and time. Use of additional parameters like sediment discharge, ocean

temperature, data on coastal infrastructure and salinity intrusion will add new dimension to these studies

This study revealed that 28% of the Odisha coastline is in the high vulnerable category, 59 % in the medium vulnerable category, and 13 % in the low vulnerable category.

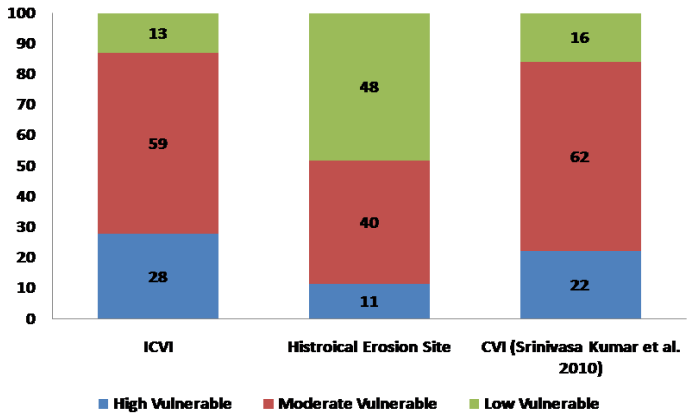

Figure 6 – Proportion of Odisha coastline vulnerable to severe cyclonic storms

Further, it highlights that the district of Jagatsighpur, Kendrapda and Puri are present in high vulnerable class. The result of this analysis is consistent with output of Coastal Vulnerability Assesment of Odisha coast by Srinivasa Kumar et al., 2010, thus validating the credibility of this study (Figure 6).

Moreover these areas are historically vulnerable to storms, storm surge and coastal flooding. Based on fieldwork performed to validate the accuracy of the eroded sites by comparing the analyzed result showed a different result with 11 % of total coastline are considered as highly vulnerable, 40 % of total coastline considered as moderate vulnerable and 48 % of total coastline are considered as low vulnerable. From ecological perspective, turtle nesting sites, mangrove and estuary mouths are the areas of highest risk from these extreme events. Thus, this kind of interpretation of vulnerability in each zone based upon groups of indicators will help for the purpose of designing policy and mitigation measure to increase their flexibility and specificity.

Replications of this approach to address relevant characteristics of different zones require adjustment not only in methodology but also for the best use of available data. The final computed output has practical limitation because the index does not explain the assumption and evaluation that lead to calculation to user. Further, this assessment can be refined in second phase by designing an integrated assessment and management tools at different spatial and temporal scale for different policy purpose. The information derived from this assessment combined with future modeling assessments will feed the coastal decision maker of Odisha and also policy

makers of developing countries for better coastal management. However, the sustainable management of coastal zone depends mainly on the successful implementation of an integrated adaptation to driver of changes that taken in consideration of promoting resilience of coastal ecosystems. Therefore, there is a need to pragmatically define proactive adaptation strategies and delineate the vulnerable coastal area by evolving methodology to rely more on coastal processes than administrative boundaries by incorporating wide expertise in defining the relevant areas. The difficult task faced by society in coming days is to provide a cautiously constructed research base that is skilled of defining the coherent management unit derived from vulnerability assesments and also the precise limits of such tolerances. Only then coastal manager in developing countries will be able to utilize the coastal resources in a sustainable manner.

6. Concluding Remarks

The primary purpose of the integrated coastal vulnerability mapping for coastal Odisha is to identify the coastal zones which potentially vulnerable to coastal hazards. It gets a relative value of risk quantified in terms of severity and likelihood. It is a start of bold attempt to get societies to become part of overall ICZM processes. The ICZM plan should ensure to capture the impacts of both climatic and non climatic changes so that development will not increase the vulnerability of the region. These people of coastal Odisha can be empowered by offering understanding of the behavioral changes of the coast and make them part of sustainable process of developed. Action research, embedded in ongoing policy processes, offers the opportunity of fostering real-time dialogue with policymakers, and input to key development and adaptation planning initiatives over the medium- to long-term. This understanding and explaining of sustainable dynamic coastal systems to the public will help in their participation in public dialogue about adaptation strategy, as well as preparing them for governance with respect to science policy decisions. Hence science engenders democracy by evolving how people think and by enhancing how they interact. The real value of ICZM is by undergoing examination of the susceptibility, sensitivity and resilience of coastal systems.Thus the optimum management overlay by which these natural tendencies can be allowed to best continue in association with anthropogenic activities can be established. This study provides a triggering point for coastal planners and government official of developing countries for more detail site specific investigation in coastal littoral zones of the state.

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ESTIMATION OF INCLUSIVE GROWTH IN AGRARIAN ECONOMY

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Abstract

Inclusive growth means benefit of growth must be distributed equitably and evenly in the society. All the persons of the society have opportunity to participate in the growth of the economy. The Eleventh Five Year Plan and TwelfthFive Year Plan both have set as their prime objective 'faster and more inclusive growth'. Since independence several programs have been launched for up liftmen of both rural and urban poor from below the poverty line. Despite of all the efforts made, we failed to achieve the desired result. Robust economic growth of the country has also failed to last its positive impact on poor. In Eleventh Five Year Plan government has changed the strategies for economic development of the country. New strategy INCLUSIVE GROWTH was adopted. This was done so as to achieve the benefit of economic growth that may reach to poor equally and evenly. In agrarian economy agriculture is critical for sustainable development and poverty reduction. Agricultural growth is a powerful means for inclusive growth. It is also evident that agriculture plays an important role in stimulating growth in non agricultural economy in short and medium term. An humble effort has been made in this paper (i) to know whether the benefits of agricultural growth has trickle down to rural poor or not, say whether agricultural growth is inclusive or not, and (ii) to assess whether financial inclusion through agricultural finance has occurred or not. The paper is based on both the secondary information as well as on the primary information that has been collected from Badwani district of Madhya Pradesh.

The outcome of the study reflects that agriculture alone cannot make substantial reduction in the incidence of rural poverty. For inclusive growth in rural areas, government has to focus on various rural development programs those may be helpful in raising the living standard of rural people.

Key Words: Inclusive growth, Equity index, Social Mobility, Poverty, Inequality

1. Introduction

Inclusive growth is a buzzword across the globe. It is both an outcome and a process. It can be observed from perspective as the focus is on productive employment as a means of increasing

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income for excluded groups. In other words growth is considered to be pro poor as long as poor benefit in absolute term. The effort is to generate, pro poor growth, if the incomes of poor people grow faster than inequality will decline.

Inclusive growth means benefit of growth must be distributed equitably and evenly in the society. All the persons of the society have opportunity to participate in the growth of the economy. Growth may be inclusive if productivity improves and new job opportunities are created for the excluded section. Indian economy was growing at faster rate since the economic reforms of the early 1990s. Average growth rate was around 7percent during 1993-94 to 2009-10. This growth rate reached up to 8.5 percent during 2004-05 to 2009-10. Many poor states also touched the double digit rates. Resultant poverty reduced substantially. Since 2004-05 to 2009-10 it declined by 1.5 percent points per year. Since 2004-05 to 2011-12 poverty declined by 2.2 percent points per year. But it is irony to state that inequality has risen rapidly in the period of rapid growth and poverty reduction (2004-09). Regional inequalities and rural urban disparity also has increased during the period (2004-09). It has been observed that disparity and inequality has not only increased in developed states but also in poorer states also.

No doubt, effect of 'trickle down' of economic growth was working but it takes too long time and there was a need to focus on inclusive growth. To reduce widened disparities, the government came with this idea and policy for achieving faster and more inclusive growth. The eleventh five year plan (2007-08 to 2011-12) and twelfth five year plan (2011-12 to 2013 to 2017-18), both have set as their prime objective is to foster faster and more inclusive growth. The vision of the twelfth plan document is "of India moving forward in a way that would ensure a broad based improvement in living standards of all sections of the people through a growth process which is faster than in the past, more inclusive and also more environmentally sustainable."

In agrarian economy agriculture is critical for sustainable development and poverty reduction. Agricultural growth is a powerful means for inclusive growth. It has been observed that economic growth is a major driver of poverty reduction and inclusiveness in India. It is also evident that agriculture plays an important role in stimulating growth in non-agricultural economy in short and medium term.

An effort has been made in this paper:

i. To know whether the benefits of agricultural growth has trickle down to rural poor or not, say whether agricultural growth is inclusive or not.
ii. To assess whether financial inclusion through agricultural finance has occurred or not.
iii. To find out the rhythm and soul i.e. reasons for inequality in income distribution.

The paper is organised as follows: section1 deals with introduction. Section2 presents review of literature whereas; section 3 speaks about data base and methodology. Section 4 provides empirics of the study, followed by the conclusion and policy implications to section5.

2. Review of Literature

Agricultural growth has been observed to be more beneficial to the poor than growth in other sectors. Studies reveal that increasing agricultural productivity has been probably the single most factor in determining the speed and extent of poverty reduction. According to Datt and Ravallion (1996), rural sector growth in India reduced poverty in both rural and urban areas. Warr (1001) provided evidences that growth in agriculture has reduced poverty significantly. Gallup et al. (1997) observed in their study that every 1 percent growth in per capita agricultural gross domestic product led to 1.61 percent growth in the incomes of the poorest 20 percent of the population. Other scholars have reached to the similar conclusion. According to Bourguignon and Morrison, (1988), Timmer, (1997), de Jaunvry and Sadoulet, (1996), agricultural growth reduces poverty. It is usually conditional upon the initial distribution of assets and initial level of inequality. Agricultural productivity also plays role in reduction of poverty. Thirtler et al. (2001) concluded from their study that every 1 percent increase in labour productivity in agriculture reduced the poverty. Across the globe poverty remains a predominantly rural problem and agriculture is central to livelihood. Lanjouw and Stern, (1988); Hazell and Ramaswamy, (1991) have experienced in their studies that agricultural productivity gains have raised rural incomes in two ways: by directly increasing farmers' income and particular importance to the poorest, by increasing employment opportunities and wages. Bardhan (1985) did not find any evidence of the existence of strong linkage between agricultural productivity and poverty reduction. But Roy and Pal (2002) said that an improvement in agricultural productivity has significant effect on reducing rural poverty in India. Srinivasan (1985) has interpreted result very carefully and derived conclusion that there was very little evidence of trickle down mechanism at all India level.

3. Data base and Methodology

3.1 Data base

3.1.1 Agricultural performance is measured by State Domestic Product in agriculture per head of rural population (SDPAR). It affects rural poverty. To estimate this state wise information collected from NSSO and CSO reports for 1987-88, 1993-94, 1999-2000, 2004-05 and 2010-11.

3.1.2 To assess whether financial inclusion through agricultural finance has occurred or not. Primary information was collected from Sandhwa block, Badwani district of Madhya Pradesh (India). 100 small farmers (50 each from RRB and SBI) who were advanced agricultural credit have been selected by random sampling. Their post agriculture finance income has been considered for inclusiveness.

3.1.3 To work out the factors responsible for inequality, only amount of agricultural credit advanced to the farmers by the banks (RRB & SBI) and farmers' level of education have been considered.

3.2 Methodology

3.2.1 For estimating effect of performance of SDPAR on rural poverty (RPOV), the OLS method was adopted.

$$Y_t = \beta_0 + \beta_1 X_t + U_t$$

Where, Y_t– Rural Poverty X_t– SDPAR β_0 - Intercept
β_1- Coefficient of SDPAR U_t– error term

3.2.2 Anand and others (2013) model was applied. They have used the concept of a concentration curve to define inclusiveness and define a social mobility curve S^c–

$$S^c \sim (y_1, (y_1+y_2)/2,.....,(y_1+y_2+....+y_n)/n)$$

Where, n- The number of persons in the population with incomes $y_1, y_2,...,y_n$,
y_1- The poorest person and y_n- The richest person.

Anand and others (2013) developed an index which was used to derive the magnitude of the change in income distribution. It was calculated from the area under the social mobility curve.

$$\bar{Y}^* = \int_{i=0}^{50} \bar{Y} i \, di$$

The greater is $\bar{Y}^*$, the greater is the income. If the income of everyone is equal or same (it means, income distribution is perfectly equitable) then

$$\bar{Y}^* = \bar{Y}$$

If, $\bar{Y}^* > \bar{Y}$ or $\bar{Y}^* < \bar{Y}$

It implies that the distribution of income is inequitable.

Therefore the derivation of $\bar{Y}^*$ from $\bar{Y}$ is an indication of inequality in income distribution.

By using this feature of $\bar{Y}^*$, an income equity index (ω) can be written as

$$\omega = \bar{Y}^* / \bar{Y}$$

For a complete equitable society, $\omega=1$. Thus, higher value of ω (closer to 1) represents higher income equality.

3.2.3 To work out the factors responsible for measuring inequality the following regression model was applied: $Y_i = \alpha_0 + \alpha_1 X_1 + \alpha_2 D_1 + U_t$

Y_i- individual income equity index α_0- intercept
α_1 – coefficient of agricultural loan α_2 – coefficient of farmers' education
X_1 – amount of agricultural finance advanced to farmers
D_1 – level of farmers' education U_t– error term

4. Empirics

Table 1 Dimensions of Rural Poverty in India

Year	Rural	Total
1970-71	47.8	44.98
1973-14	47.6	46.18
1983-84	40.4	37.4
1989.90	28.2	25.8
1993-94*	50.1	45.3
2004-05*	42.0	37.2
2011-12*	25.7	21.9

- Estimated by Tendulkar Method

Table 1 shows the magnitude of poverty in India and in rural areas. In 1983-84 and 1989-90 poverty ratio also declined drastically. It is apparent from above table that in 1983-84 and 1989-90 poverty ratio also declined drastically. The ratio of population below the poverty line was more than 45 percent in 1993-94. The intensity of rural poverty was more than 50 percent. 17 %-a gepointsrural poverty has declined between 2004-05 and 2011-12.

People living below poverty line (BPL has come down from 37.2% in 2004-05 to 21.9% in 2011-12. It shows a decline of 15.3 percentage points in a period of seven years. In rural areas, it came down to 25% from 42%. The data reveal that the poverty rate in the country declined 2.18percentage points in each year during the period 2004-05 & 2011-12.The estimates are based on Suresh Tendulkar's methodology for deciding the poverty line.

4.1.2 Regional Variation

Above discussion reveals only the macro picture. Region wise analysis would provide further insight into the problem of rural distribution. A state wise data are extremely useful for the analytical approach. Table 2shows regional variation in the level of rural poverty in different states of the country.

Table 2 Percentage of Population Below Poverty Line (Tendulkar Methodology)

Sr.	State	2004-05	2009-10	2011-12
1.	Andhra Pradesh	32.3	22.8	11.0
2.	Assam	36.4	39.9	33.9
3.	Bihar	55.7	55.3	34.1
4.	Gujarat	39.1	26.7	21.5
5.	Haryana	24.8	18.6	11.6
6.	K. Taka	37.5	26.1	24.5
7.	Kerala	20.2	12.0	9.1
8.	M.P.	53.6	42.0	35.7
9.	Maharashtra	47.9	29.5	24.2
10.	Orissa	60.8	39.2	35.7
11.	Punjab	22.1	14.6	7.7
12.	Rajasthan	35.8	26.4	16.1
13.	T.N.	37.5	21.2	15.8
14.	U.P.	42.7	39.4	30.4
15.	W.B.	38.2	28.8	22.5
	All India	41.8	33.8	25.7

Source: report of the expert group to review the methodology for measurement of poverty-Government of India Planning Commission (2014)

The above table reveals that the proportion of population below the poverty line had come down in 2011-12 in comparison in 2004-05 except Assam but the intensity of poverty is more or

less similar in the poor and backward states consequently no substantially change has been noticed in the ranking of the states. In the Year 2011-12, the proportion of rural poor was highest in Orissa and M.P. and lowest in Punjab. In case of Orissa & Madhya Pradesh, these have low per capita income coupled with poor infrastructure.While in Punjab, it was lower due to higher per capita level of land, income, cultivable land and irrigated facilities.In the regional variation of the intensity of poverty, it is noteworthy that five states (Orissa, M.P, Bihar, Assam, U.P.) have rural population below the poverty line more than the national average 25.7 per likewise.

4.1.3 Impact of Trickle down on Inclusive Growth

No doubt, agriculture is the main source of livelihood of rural people Agriculture performance determines the living standard of rural people. Therefore an effort has been made to examine the impact of trickle down of agricultural performance on rural poverty. In other words, it can be said that inclusiveness has been gazed with the help of agriculture performance in terms of state domestic product in agriculture per head of rural population (SDPAR). It has been assumed that an increase in SDPAR means improvements in living standard of rural people including rural poor Result of rural poverty and SDPAR is as below.

$$Y_t = \beta_0 + \beta_1 X_t + U_t$$

1987-88 $Y_{(RPOV)} = 51.32 - 0.018$ SDPAR R^2 0.42
(3.10)*

1993-94 $Y_{(RPOV)} = 48.24 - 0.014$ SDPAR R^2 0.40
(2.94)*

1999-2000 $Y_{(RPOV)} = 39.81 - 0.014$ SDPAR R^2 0.38
(2.81)*

2004 – 05 $Y_{(RPOV)} = 35.12 - 0.01$SDPAR R^2 0.33
(2.57)*

2010-11 $Y_{(RPOV)} = 294.35 - 0.16$ SDPAR R^2 0.33
(2.62)*

* Significant at 1 percent level

In the above result there is inverse relationship between rural poverty and SDPAR. Analysis depicts negative coefficient of SDPAR which indicates that increase in SDPAR reduces the magnitude of rural poverty. In other words, the benefit of agricultural growth has been trickled down to the rural poor. That is to say, agricultural growth is inclusive to certain extent.

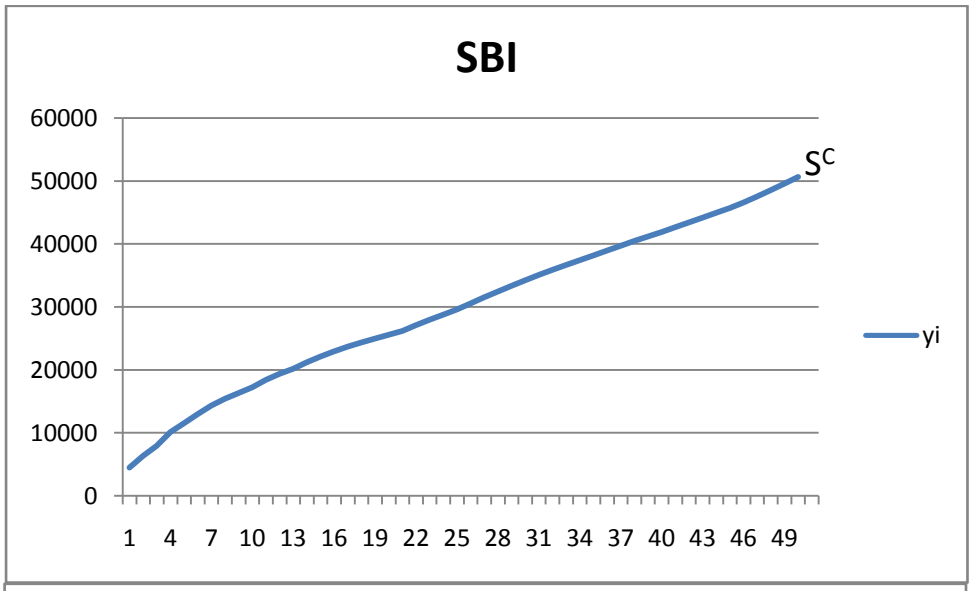
If we see above results, in all the years' strength of relationship between RPOV and SDPAR (except 2010-11) and explanatory power of the model (R^2) appear to have declined over the period. Similarly, the absolute value of coefficient of SDPAR has declined except 2010-11. But increase in absolute value of coefficient of SDPAR in 2010-11 is also very nominal or negligible.

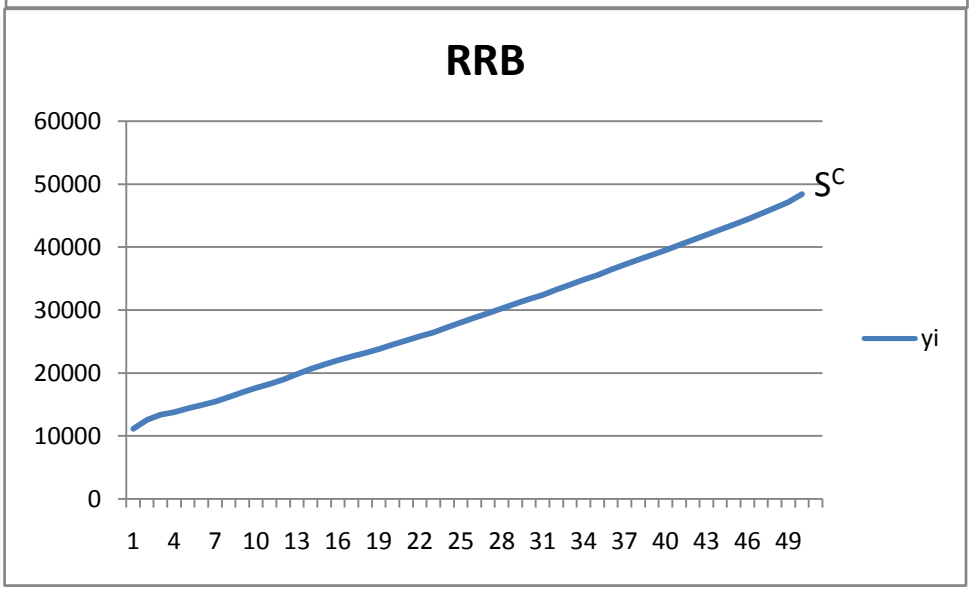
More explicitly the impact of trickle down and inclusiveness of agricultural growth have limited and are not so strong. It means, alone agricultural growth cannot be substantial for inclusive growth of rural people including rural poor.

4.2 Social Mobility & Inclusive Growth

Anand & others (2013) have developed a concentration curve for measuring inclusiveness with the help of social mobility curve S^C

$$S^c = (y_1, (y_1+y_2)/2, ..., (y_1+y_2+....+y_n)/n)$$





For achieving this curve primary information was collected from farmers of Badwani District of M.P. (India).

There are two curves which have been drawn one for those farmers who have been advanced agricultural loan by the Regional Rural Banks and other, one who has been given agricultural loan by the State Bank of India.

From the graphs, social mobility curves with the same average income ($\bar{Y}$)& but different degrees of inclusiveness (i.e. different income distribution) with respect to their banks have been observed.

To concretize the picture of inclusiveness, income equity index (ω) has been calculated separately for the farmers of both banks i.e. Regional Rural Bank & State Bank of India.

$$\omega = \bar{Y}^{*} / \bar{Y}$$

Anand & others (2013) has assumed that ω =1 for a completely equitable society. In other words, higher value of ω (closer to 1) represents higher income equality.

ω	RRB		SBI	
	Number	%	Number	%
0.00-0.25	1	2.00	5	10.00
0.20-0.50	18	36.00	15	30.00
0.51-0.75	17	34.00	15	30.00
0.75-1.00	14	28.00	15	30.00

From above table, it can be said that 30% farmers who have been benefited by the State Bank of India is closer to ω = 1 (0.75 to 1.00). In other words, they are supposed to attain higher income equality. While in 0.51 – 0.75 group of ω, 34% of RRB benefited farmers are moderately better than first two groups 0.00 to 0.25 & 0.26 to 0.50.

On the basis of income distribution, it may be concluded that around 30% of SBI benefited and 28% of RRB benefited loanees are enjoying the fruit of financial inclusion as these farmers were advanced agricultural loan for raising their production and income.

First two rows of the table show that 39% (19 & 20 respectively of RRB and SBI)of people have not reached the benefit of financial inclusion and their income to very much inequitable. In other words bottom stratum has more inequality in income distribution.

4.3 Factors responsible for inequality

$$Y_{RRB} = 3.231 + 2.31\ X_{ag.\ Loan} + 0.326\ X_{edu.}$$

(5.231)** (2.20)*

$$Y_{SBI} = 1.245 + 3.147\ X_{ag.\ Loan} + 1.271\ X_{edu.}$$

(3.213)** (1.991)*

*Significant at 1 percent level ** Significant at 5 percent level

From above results, it can be said that income equity index has positive relationship with agricultural loan as well as education. It can be inferred from above equations that these two

factors- agricultural loan and education are also responsible for income equity. Results are statistically significant also. If amount of agriculture loan is given adequate, it may play positive and stimulus role in the growth of rural sector. Knowledge plays vital role in adoption of new technology. Majority of farmers are illiterate and they believe in their indigenous method of cultivation. As study has been conducted in tribal belt, all selected farmers are tribal.

5.Policy and its implications

The outcomes of the study reflect that agriculture alone cannot make substantial reduction in the incidence of rural poverty. For inclusive growth in rural areas, government has to focus on multifaceted strategies of rural development programmes those may be helpful in raising the living standard of rural people. Results of the study do not deny completely that agricultural growth is not in position to uplift rural poor. Green Revolution recipe is still as valid today as it was in the past. Right policies and support will raise the productivity which will reduce rural poverty. To reduce inequality in the agrarian society, government has to advance sufficient amount of credit to small farmers as well as government should launch a comprehensive educational plan with the help of Public - Private Partnership (PPP) model for educating and developing skills amongst marginalised family of the agrarian society.

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An analysis of Diversification of Agriculture and Financial System in India

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I **Introduction**

Agriculture plays a pivotal role in the Indian economy. The pressure on agriculture to produce more and raise farmers' income is high. Second, the dependence of the rural workforce on agriculture for employment has not declined in proportion to the sectoral contribution to GDP. This has resulted in widening the income disparity between the agricultural and non-agricultural sectors (Chand and Chauhan, 1999). The experiences of developed countries show that transfer of labour force from agriculture to non-agriculture, in particular the manufacturing sector took place. This had brought enhanced productivity growth in agriculture and hence higher income (Gollin et al., 2002). However, India's manufacturing sector witnessed volatile growth and its share in GDP has almost remained constant at 15 per cent for the last three decades. Further, given the fact that the current economic growth pattern is driven by the service sector, labour absorption outside agriculture will be slow until rural education improves dramatically in the near future. At the same time, although the contribution of agriculture to gross domestic product (GDP) is now around one sixth, it provides employment to 56 per cent of the Indian workforce. Also, the forward and backward linkage effects of agriculture growth increase the incomes in the non-agriculture sector. The growth of some commercial crops has significant potential for promoting exports of agricultural commodities and bringing about faster development of agro-based industries. Thus agriculture not only contributes to overall growth of the economy but also reduces poverty by providing employment and food security to the majority of the population in the country and thus it is the most inclusive growth sectors of the Indian economy. The 12^{th} Five Year Plan Approach Paper also indicates that agricultural development is an important component of faster, more inclusive sustainable growth approach.

The structural reforms and stabilization policies introduced in India in 1991 initially focused on industry, tax reforms, foreign trade and investment, banking and capital markets. Meanwhile, populations continued growing, increasing numbers of rural people could not live on agriculture alone. To survive they had to engage in numerous activities: on-farm, off-farm and non-farm. At the same time, as a response to new economic environment ushered in by the process of liberalization, Indian agriculture too underwent spectacular changes in recent period. These changes are manifestations of large scale commercialisation and diversification taking place in the agricultural sector. They broadly include cultivation of new crops and varieties, increase in the share of area under cash crops, large scale spread of livestock activities

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and fisheries, pursuance of hi-tech agriculture in the areas of aquaculture, bio-technology, horticulture, processing, etc. Thus, rural households and rural economies got increasingly diversified. However, access to finance was the limiting factor. Agricultural credit had been exclusive. It excluded all those who didn't own and till the land

II Agricultural Diversification – A Paradigm shift

Before the advent of the British rule, crops such as cotton, tobacco and sugarcane were grown fairly extensively since land revenue had to be paid mostly in cash and the prices of these crops, relative to those of foodgrains, were much higher at that time. Even during the British rule, the situation did not change much. Though the primary concern of the rulers from then onwards was the expansion of trade, some of the policies in pursuit of this objective introduced market forces into agriculture.

Due to the challenge of feeding our vast population and the experience of food shortages in the pre-independence era, 'self reliance' in foodgrains has been the cornerstone of our policies in the last 50 years. Growth in area was the major source of production growth until early 1960s (Bhalla and Singh, 2001; Vaidyanathan, 2010). The high yielding varieties introduced in wheat and rice during the late Sixties heralded India's green revolution. Along with technology, new institutional structures enabled the farmers to adopt improved methods of cultivation. The major changes included provision of better irrigation facilities, government procurement system, guaranteed support price and input subsidies. The onset of this revolution during mid-sixties resulted in widespread use of modern inputs such as HYV seeds, water, fertilizers and pesticides leading to impressive growth in yield levels. As a result, there was a spurt in marketable surplus.

With the advent of modern agricultural technology, especially during the period of the Green Revolution in the late sixties and early seventies, there is a continuous surge for diversified agriculture in terms of crops, primarily on economic considerations. While most definitions of diversification in developing countries work on the assumption that diversification primarily involves a substitution of one crop or other agricultural product for another or an increase in the number of enterprises, or activities, carried out by a particular farm. In developing countries such as India, which has been one of the leaders in promoting diversification, the concept is applied both to individual farmers and to different regions, with government programmes being aimed at promoting widespread diversification. The concept in India is seen as referring to the "shift from the regional dominance of one crop to regional production of a number of crops ..... (which takes into account)..... the economic returns from different value-added crops... with complementary marketing opportunities".[3] Diversification to commercial crops/commodities thus becomes an essential strategy that can increase income levels in agriculture, reduce risks of crop failures and earn foreign exchange. Further, diversification can be designed to help poverty alleviation, employment generation and environmental conservation.

Diversification in agriculture can be achieved across the sub-sectors as well as within each sub-sector. Sub-sector wise composition of income generated and the composition of total value of output are considered for measuring diversification across sub-sectors and within sub-sectors, respectively. In Indian agriculture, diversification has occurred across sub-sectors, viz. crop sector, livestock sector, forestry plus logging and fishing as well as within each of these sectors. In more recent times, diversification towards high-tech and innovative enterprises in the primary sector such as floriculture, horticulture and towards secondary (manufacturing) sector such as agro/food processing and rural non-farm sector has been gaining momentum.

The crop pattern changes, however, are the outcome of the interactive effect of many factors which can be broadly categorized into the following five groups:

a) Resource related factors covering irrigation, rainfall and soil fertility.

b) Technology related factors covering not only seed, fertilizer, and water technologies but also those related to marketing, storage and processing.

c) Household related factors covering food and fodder self-sufficiency requirement as well as investment capacity.

d) Price related factors covering output and input prices as well as trade policies, including LPG and other economic policies that affect these prices either directly or indirectly.

e) Institutional and infrastructure related factors covering farm size and tenancy arrangements, research, extension and marketing systems and government regulatory policies.

The cropping pattern in India has undergone significant changes over time in the crop-mix over time in favour of superior cereals, non-traditional oilseeds such as sunflower, soyabean, etc. These changes have been largely the manifestations of conscious public policy support through price incentives, investment in generation of new technology, etc. Diversification of agriculture, outside the crop sector by way of subsidiary enterprises in animal husbandry, poultry, fisheries, sericulture, horticulture etc., has been an important development that accompanied commercialization. India ranks first in the world in fruit and second in vegetable production. The estimated annual production of horticultural products is 100 million tonnes. The exports of processed fruits and vegetables have been increasing steadily during the recent years. The value of exports of the fruits and vegetable products such as dried and processed vegetables, mango pulp, pickles and other processed products has been steadily increasing.

Table 1 Share of Area under Major Crops in India

(Percentage of GCA)

Crops	TE 1970-71	TE 1980-81	TE 1990-91	TE 2000-01	TE 2007-08
Rice	23.02	23.18	23.00	23.82	22.57
Wheat	10.42	12.98	13.04	14.28	14.18
Coarse Cereals	28.48	24.25	20.48	16.17	15.14
Total Cereals	61.93	60.41	56.53	54.27	51.88
Total Pulses	13.50	13.23	12.94	11.49	11.93
Total Food grains	75.54	73.67	69.47	65.32	63.52
Total Oilseeds	9.85	10.11	12.51	12.96	13.93
Groundnut	4.42	4.14	4.64	3.68	3.20
Cotton	4.70	4.27	4.08	4.70	4.68
Jute	0.42	0.51	0.39	0.45	0.41
Total Fibres	5.41	5.08	4.64	5.27	5.18
Sugarcane	1.62	1.62	1.90	2.23	2.47
Tobacco	0.27	0.25	0.22	0.21	0.19
Condiments and Spices	1.04	1.23	1.32	1.52	1.55
Potatoes	0.31	0.43	0.51	0.69	0.76
Onions	-	0.14	0.17	0.24	0.36
Total Fruits & Vegetables	2.24	2.77	3.57	4.35	5.10
Fodder Crops	4.15	4.50	4.59	4.55	4.26
Total Non-Food grains	19.39	20.13	23.60	25.44	26.41
Gross Cropped Area (GCA)	100.00	100.00	100.00	100.00	100.00

Source: Directorate of Economics and Statistics, Government of India

There is a definite shift from food grains to non-food grains such as fruits and vegetables, oilseeds, fibres and condiments and spices whose share in both area and in value of output has been increasing over time. As the cultivated area remains more or less constant, the increased demand for food because of increase in population and urbanisation puts agricultural land under stress resulting in intensification and substitution of food crops with commercial crops. The change in the share of area under major crops in India is as shown in the Table 1:

It is evident from table 1 that area under food grains in gross cropped area (GCA) declined by 12.02 per cent mainly due to fall in area under coarse cereals by 13.34 per cent between Triennium Ending (TE) 1970-71 and TE 2007-08. Wheat has gained importance with

area allocation of only 10.42 per cent in TE 1970-71, and it steadily increased to 14.18 per cent in TE 2007-08. Area under rice remained more or less constant during the period under study. Interestingly, area lost by food grains was used for the cultivation of oilseeds, fruits, vegetables and non-food crops to the extent of 4.0 per cent, 2.86 per cent and 7.02 per cent, respectively, between TE 1970-71 and TE 2007-08. Hence, it is clear that commercial crops took the lead in terms of area share. However, the analysis of the contribution of different crops in total value of output shows that besides the level of physical output, this also captured the producer price of various crops in the country. Among crop groups, cereals accounted for the largest share of total output followed by fruits and vegetables, oilseeds and fibres. While the contribution of cereals declined marginally from 35.02 per cent in TE 1970-71 to 31.24 per cent in TE 2007-08, the share of fruits and vegetables increased considerably from 15.88 per cent to 24.27 per cent during the same period. The changing share was largely determined by commodity price, which rose proportionately higher for fruits and vegetables rather than cereals during the recent decade (Chand et al., 2011).

If we analyse the contribution of different crops in total value of output, besides the level of physical output, this will also capture the producer price of various crops in the country.

Table 2 shows that among crop groups, cereals accounted for the largest share of total output followed by fruits and vegetables, oilseeds and fibres. While the contribution of cereals declined marginally from 35.02 per cent in TE 1970-71 to 31.24 per cent in TE 2007-08, the share of fruits and vegetables increased considerably from 15.88 per cent to 24.27 per cent during the same period. Among the individual crops, rice accounted for the major share in the total value of output, but declined from 2000 onwards. Similarly, the value of wheat output reported a steady increase until 2000 and declined thereafter. Pulses also registered a decline in value of output from 8.42 per cent in TE 1970-71 to 6.25 per cent in TE 1990-91 and then to 4.38 per cent in TE 2007-08. Despite increase in producer price of pulses, output did not keep pace due to the vagaries of weather and allocation of smaller area for cultivation of pulses by farmers. Cotton, however, increased in value of output in the current decade to 4.86 per cent from 3.40 per cent in TE 1990-91. The widespread cultivation of Bt cotton was the major reason for the rise in production of cotton. Condiments, spices and sugar also registered an increase in their share in total value of output in the last four decades.

Overall, the analysis of the data clearly indicates that there was broad-based agricultural production in the 1980s but the phenomenon of commercialization of agricultural production seems to have gained momentum since early 1990s. There is a definite shift from food grains to non-food grains such as fruits and vegetables, oilseeds, fibres and condiments and spices whose share in both area and in value of output has been increasing over time.

Another noteworthy feature of Indian agriculture is that it is the home of small and marginal farmers (80%). Therefore, the future of sustainable agriculture growth and food security

Table 2 Share of various crops in Value of Output

(Percent)

Crops	TE 1970-71	TE 1980-81	TE 1990-91	TE 2000-01	TE 2007-08
Cereals	35.02	36.25	36.95	34.40	31.24
Rice	18.65	18.61	19.59	18.10	16.54
Wheat	7.25	9.87	10.92	11.62	10.17
Coarse Cereals	9.17	7.74	6.44	4.68	4.53
Pulses	8.42	6.55	6.25	4.78	4.38
Gram	3.54	2.57	2.06	1.75	1.67
Arhar/Tur	1.55	1.37	1.38	1.06	0.96
Oilseeds	7.47	6.59	8.84	7.94	8.33
Groundnut	3.94	3.28	3.69	2.36	2.16
Sunflower	-	0.04	0.26	0.25	0.38
Coconut	1.33	1.11	1.28	1.42	1.32
Sugars	4.86	4.28	4.53	6.02	5.82
Fibres	3.60	4.04	3.83	3.41	5.25
Cotton	3.09	3.47	3.40	2.99	4.86
Tea	0.80	0.86	0.79	0.81	0.79
Coffee	0.30	0.36	0.35	0.47	0.40
Tobacco	0.78	0.78	0.68	0.56	0.42
Condiments & spices	2.70	3.20	3.49	4.16	4.52
Potatoes	0.73	1.10	1.27	1.57	1.45
Fruits & vegetables	15.88	18.83	17.87	23.25	24.27
Value of Output from Agriculture	100.00	100.00	100.00	100.00	100.00

Source: Central Statistical Organisation, Government of India

in India depends on the performance of small and marginal farmers. The role of small farms in development and poverty reduction is well recognized (Lipton, 2006). The global experience of growth and poverty reduction shows that GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture (WDR, 2008).

As far as the role of small and marginal farmers in the process of diversification is concerned Birthal et al (2011) provide four conclusions from the cropping patterns adopted by this category of farmers: (a) small and marginal farmers allocate larger proportion of their cultivated land to high value crops like fruits, and vegetables ; (b) small and marginal farmers seem to have comparative advantage in growing vegetables than fruits because of quick returns in the former; (c) small and marginal farmers allocate larger proportion of rice and wheat than other farmers; (d) small and marginal farmers allocate lower proportion of land to pulses and oilseeds.

In terms of production, small and marginal farmers also make larger contribution to the production of high value crops. They contribute around 70% to the total production of vegetables, 55% to fruits against their share of 44% in land area (Birthal, 2011). Their share in cereal production is 52% and 69% in milk production. Thus, small farmers contribute to both diversification and food security**.** Only in the cases of pulses and oilseeds, their share is lower than other farmers.

Crop diversification in India was an age old phenomenon but there has been acceleration in the commercialization after 1991. Corporatisation in the agricultural sector has emerged in the form of establishing teak farms, orchards, plantations, floriculture, etc. The cost of land, maintenance etc., are met through public subscription of shares with promises of attractive returns on the investments to the investors. A wide variety of schemes, including schemes for fixed deposits, are being floated. Most of the companies are engaged in developing wastelands. For instance, Maxworth Ltd., could develop 15,000 acres of land since 1993. Some of the other prominent players in this enterprise are Suman Motels (floating Green Earth bonds) and Anubhav Group (Teak plantations). Although most of the schemes concentrate on teak and other plantations and orchards, even goat-rearing is offered for public participation recently by some of the corporate promoters. While success of such schemes is yet to be established, these ventures are important attempts to combine professionalism of a few with pooled resources from a large number of people, thereby indirectly involving a cross-section of population in agriculture. The case of ITC's diversification into oilseeds, Pepsico's entry into fruit/vegetable processing can be cited as forerunners of corporatisation of agriculture.45. The proliferation of such ventures, however, depends on the willingness of the State Governments to amend Land Ceiling Acts. Two State Governments - Madhya Pradesh and Maharashtra - took the initiative to make farm land available for joint ventures. Madhya Pradesh decided in June 1995 to grant case-by-case exemption from land ceiling laws for corporate farming and agro-development projects. Maharashtra allowed State Farming Corporation (SFC) to take up joint cultivation with private partners. SFC provides land whereas the private partners contribute financial and technical inputs.

Therefore, a clear shift in the paradigm of agricultural diversification is evident. Consequently, a fuller utilization of agriculture potential requires a comprehensive strategy for agriculture diversification. Agricultural growth can be further accelerated through mutually supportive forward and backward integration leading to better post harvest management and higher value addition. While at the macro level, cereal production continues to dominate, it is increasingly evident that diversification will drive higher rates of production, income and off-farm employment growth.

III Agricultural Financial System – A Paradigm Shift

During the 1960s and 1970s the key issue in agriculture and rural development was agricultural production. Agricultural credit was but an input, next to improved seeds and seedlings, fertiliser,

pesticides, tools and machines. The target group was farmers. The issue was how to disburse agricultural credit to farmers. The funds were provided by governments and donors. Common approach to increase agricultural lending involved the paradigm of subsidized directed credit (Yaron et. al., 1997). Governments typically intervened in financial markets to induce financial institutions to increase the supply of and reduce the interest rates for agricultural loans. The main disbursement channels were agricultural development banks and projects. Special cheap lines of credit were provided to lenders, incentives were given to open rural branches, and state-owned agricultural development banks were created to serve the sector when banks and cooperatives failed to meet lending targets. Unfortunately, these attempts to resolve supposed market failures often ended up as government failures. Increased agricultural lending may have contributed to short-term increases in food supplies, but it did not create sustainable credit supplies. Low interest rates crowded out commercial financial institutions and stimulated excess demand for loans which induced credit rationing often favoring richer and politically powerful farmers. Informal credit thrived because high borrower transaction costs reduced the advantage of low interest formal loans. Narrow operating margins and poor loan recovery caused many financial institutions to fail or require repeated recapitalizations. Borrowers became reluctant to repay when loans were viewed as coming from the government so a bad debt culture developed. Government failure occurred because the paradigm failed to resolve the basic screening, incentive and enforcement problems of rural lending (Hoff and Stiglitz, 1990). This is mainly because disbursement mattered, not repayment as agricultural credit was a service, not a business. The strategy had much to show: the green revolution, driven by technology, financed on credit, with subsidized interest rates. The produce was purchased by government at guaranteed prices. So impressive was the business of the green revolution that the business of the financial service was ignored. But when farmers didn't repay their loans, the banks didn't cover their costs and the governments ran out of money to finance the subsidies, the banking business finally failed, and so did the service.

Here, it is important again to note that the farmer class is not a homogeneous group. They belong to different economic and social groups. Most of the poor and marginal farmers do not get access to the formal credit network. The indebtedness for the small & marginal farmers from formal institutional sources is lower than large farmers and the reverse is true in the case of informal sources. The dependence on money lenders is the highest for sub-marginal and marginal farmers. Regional variations in this context also assume importance. NCEUS (2008) says that "some of the general issues that confront marginal-small farmers as agriculturalists are: imperfect markets for inputs/product leading to smaller value realizations; absence of access to credit markets or imperfect credit markets leading to sub-optimal investment decisions or input applications; poor human resource base; smaller access to suitable extension services restricting suitable decisions regarding cultivation practices and technological know-how; poorer access to 'public goods' such as public irrigation, command area development, electricity grids; greater

negative externalities from poor quality land and water management, etc". Small holdings also face new challenges on integration of value chains, liberalization and globalization effects, market volatility and other risks and vulnerability, adaptation of climate change etc. (Thapa and Gaiha (2011). Recent "world-wide processes of farm change – commercialisation of increasing proportions of input and output: institutional developments such as super markets; privatization of key aspects of technical progress, and of output and process grades and standards – now indicate large farm focus" (Lipton, 2006).Therefore, support is needed for small holdings in the context of these world-wide processes of farm change, in which credit availability is of prime importance.

Food security can be affected by access to rural financial services and especially credit. For example, the Food and Agriculture Organization (FAO) argues that poorly functioning financial markets may make farmers reluctant to adopt new practices and technologies and to make investments needed to increase food supplies (FAO, 2011). Insurance, when bundled with credit, inputs, and other services may encourage farmers to take prudent risks knowing they will be protected in the event of disasters. An IFAD study describes ways that lack of formal credit affects rural poverty and encourages indigenous financial arrangements to take the place of missing formal finance (IFAD, 2010). For example, limited access to credit is linked to low technology agricultural production systems and to people working as unpaid family labor rather than in self- or wage employment. The vast majority of rural non-farm enterprises rely on household savings and friends and neighbors for start-up and operating capital.

Against the backdrop of this requirement of credit from the level of primary agricultural activities to the advanced level of agricultural diversification, a financial system paradigm was developed in the 1990s and contributed to MFI success and the emerging microfinance industry.3 The term "financial system" was coined to include all financial institutions, financial markets and instruments, the legal and regulatory environment, and financial norms and behavior. Key elements of this new paradigm included a broadened view of rural finance to include farming and rural non-farm activities, recognition of the importance of savings, and a belief that market discipline is reinforced through market interest rates for both savings and credit. The focus of lending shifted from meeting supply targets to responding to demand, and the evaluation of financial institutions switched from loan disbursements to viability and sustainability. Success in finance depends upon favorable macroeconomic, agricultural and financial sector policies as well as appropriate legal frameworks. Informal finance was accepted as complementary rather than usurious and harmful. Donors were urged to assist the creation of a favorable policy environment, improve the legal and regulatory framework for rural financial markets, build institutional capacity, and support innovations to lower transaction costs and improve risk management. The new paradigm focused on creating sustainable institutions rather than supplying cheap loans, treating borrowers and savers as clients rather than beneficiaries, and pricing products and services to cover costs and risks. Long-term relationships with clients were encouraged through

stepped lending – a gradual increase in loan sizes when borrowers successfully repay each loan. MFIs replaced credit lines with grants, loans and technical assistance to support institution building and improve products, institutions and policies.

In India, where NABARD, the National Bank for Agriculture and Rural Development, has promoted the establishment of about 1.6 million self-help groups (SHGs) of the rural poor and their linkages with some 36,000 bank branches. The approach, referred to as SHG Banking, is applied all over India: in marginal as well as high-potential areas. Numerous NGOs and government organisations are involved in social mobilisation and non-financial services. An example is Bharatiya Agro Industries Foundation (BAIF) Development Research Foundation an NGO which has helped some 13,000 tribal families, who are among the disadvantaged in India, to cross the poverty line: (i) through sustainable agri-horti-silvicultural production on 12,000 acres of rehabilitated lands and (ii) through commodity processing. Against a historical background of the direct sale of raw materials, six vertically integrated layers of production, processing and marketing were established in remote forest areas: (i) individual farm households for basic production on wastelands, (ii) small farmer groups for procurement and grading, (iii) community organizations (Gram Vikas Mandals) for the establishment of community processing facilities, (iv) village planning committees for the organization and coordination of activities, (v) regional cooperatives for finishing and packaging; and (vi) an apex organization for federated marketing. BAIF acted as a resource and technology sourcing agency, introduced streamlined systems, provided managerial backup services, and facilitated credit and market linkages. The two major products where producers took control of the full commodity chain were mangoes and cashews. In the case of mangoes, procurement and grading alone added 20% value. In a second step, the raw mangoes are cut into pieces and semi-pickled at village level, which are then brought to the final pickling stage by cooperatives, where they packaged and forwarded to a Producer Company for federated marketing. Value addition through processing contributed substantially to a sustainable increase in employment and income. Apart from these examples of agency based lending Government agencies, NGOs, Cooperative Societies and Micro Finance Institutions/Companies are giving micro credit or micro finance services through SHGs under different lending methodologies to rural households under joint or individual liability. This financial system too has its problems such as client exclusion, dropouts, delinquencies, defaults and borrowing from multiple MFIs. However, proper monitoring, facilitator's interventions, adequate hand holding of SHGs, and regulations for MFIs can render this system successful.

IV Reflections

Economic growth will be greater when a household or country is able to sustain genuine long-term comparative advantage in a crop; when risks are kept to manageable proportions; when the crop has strong linkages to the rest of the economy; when consumption linkages are high and when surpluses are used constructively both to hedge against uncertainty and foster growth. Some of these conditions are crop specific or depend on conditions in the international economy. Other

elements are amenable to policy interventions as well as the existence of infrastructure like processing. (Maxwell and Fernando, 1989)

Crop diversification is one of the key ingredients for agriculture transformation in India. However, this appears difficult given the fact that there are large tracts of cultivable land that are typically mono-cropped and water and resource deficient. Despite this seeming limitation, select regions with reasonable resource endowments nevertheless exhibit an opportunity for selective crop diversification. This could serve as a necessary stimulus to jump-start the agriculture transformation process.

Large-scale diversification from food grain production to perishable crops like fruits and vegetables, medicinal and aromatic plants etc. as well as animal husbandry activities is possible only with the smooth development of forward linkages in the form of agro processing industries Development of agro processing activity depends upon the adequate and timely availability of raw material and price competitiveness of the raw material available. Agro processing requires a continuous, qualitative and reliable chain right from the seed stage. In practice it has been observed that there are often frequent gluts, resulting price drops and losses for farmers, while on the other hand, the agro processors face problems in obtaining timely and adequate supply of raw materials. Many food-processing units operate at 10-20 percent capacity utilization resulting from inadequate raw material supply. Perhaps the agriculture sector should also look closely at improving logistics and enabling better output management systems. It therefore stresses the need for crop diversification process being ideally followed up with an effective vertical integration of agriculture production, processing and marketing processes.

With regard to the agricultural finance, innovative methodologies like Raithu Mitra Groups of Andhra Pradesh and Kerala Horticulture Development programme (KHDP) can be adopted. The production activity can be organized through farmers mobilized in groups based on the concept of Self Help Groups (SHGs). These SHGs manage their own affairs and select members in the group take the role as Master Farmers who serve as the link for technology, market and information. The spirit of self help enables to them to share information, inputs and other resources for the betterment of crop management practices and post harvest handling and thus enable improvement of their income levels. Social intermediaries like local NGOs, good functioning farmer associations or Kisan Kendras, could do this role of intermediation by selecting farmers, organizing them into groups, serving as a farm input provider, enabling better crop production protocols. Trained Master farmers who could serve as field-level office-less extension agents and the intermediary could serve as an output aggregator/ collector. This could serve as an informal institutional arrangement for production, marketing and enabling a better producer orientation to backward linkages. In this approach h of contract farming, high value crop production takes place in a decentralized way while marketing is centralized. Such a system generates a potent incentive in the form of higher returns, field level value addition and larger economic margins for the producers. Financial services can also be tagged on to the model by

enlisting the services of a bank or a Microfinance Institution. Agricultural processors and financial service providers can act in partnership. Contracting as of now is a very unbalanced relationship with the farmers lacking the market power to leverage and negotiate better deals. So fair contract systems can be achieved if the farmer power is aggregated not to destroy but to mutually benefit and enable more longer and sustained relationships. For governments, this type of arrangement could emerge as a means to better public service delivery to the agricultural sector.

Besides these methodological innovations in the managerial and financial systems of agricultural diversification, certain basic steps are essential to facilitate and intensify the process of agricultural development and diversification in a holistic manner. These measures can be enlisted as follows:

- Optimal use of resources like land and water
- Adequate supply of seeds and plants of improved cultivars
- Land reforms favouring modernization and mechanization of agriculture.
- Improve basic infrastructure like rural roads, power, transport, communications etc.
- Adequate post-harvest technologies and adequate infrastructure for post-harvest handling of perishable horticultural produce.
- Strengthen agro-based industry.
- Assess demographic changes and consumer preferences
- Popularize the technology and impart knowledge and skills to the extension functionaries for the transfer of technologies to the farmers.
- Explore potential in Biotechnology, genetic engineering, aquaculture, horticulture processing and Mushroom culture.
- Create database for horticultural crops.
- Work out on Decision support systems, governmental policies, geographic information system, application of information technology leading to market information
- Intensify financial inclusion for rural households engaged in agricultural diversification.
- Increase investments in the agricultural sector over the years

Finally, constraints on all levels viz. socio-eco, marketing, input, technology, infrastructural and institutional have to be addressed to promote viable agricultural diversification.

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Delimitation of Industrial regions of Chhattisgarh Basin: A Geographical Study

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Introduction

The industrialization plays a dominant role in the socio-economic development because this ensures a high rate of economic growth which overcomes the backwardness (Shrokov, 1973). Hence, the transformation of traditional society to a modern one at a very high pace may be through only in relation to technology and industrialization (Sharma, 2001). It is reflected in the evolution of different mineral based industries i.e. the upper and lower Gondwana formation possesses the korba super thermal power and huge aluminum extraction industries and their allies, the Dharwar system possesses Iron and Steel and allies industries, alluvial soil belt possesses agro based food processing industries that caused evolution of several industrial clusters in this part of the Chhattisgarh i.e. Korba, Bhilai (Nandani,Dhmdha road,Chandkhuri,Utai road, heavy industrial area, Jamul,Borai etc.) , Raipur(Urla,Siltara,Tilda,Mandirhasod), Bilaspur (Dongri, Tiffra, Sirgitti), Raigarh (Lara), Rajnandgaon (Joratari), Mahasamund (Birkauni) and Kbirdham (Harin-chapra and Bhoramdeo) (**Fig. 3**). for industries.

The study region has huge varying resource potentials which could provide ideal locations of industries.

Objectice:

This paper explores the prospects of the delimitation of industrial regions of Chhattisgarh Basin. The objectives of the delimitation of the industrial region of Basin is to find out the industrial regions on account of the level of the industrial development, so that better planning for further industrialization could be perused in the Basin.

Hypothesis

- **i.** The above geographical accounts of significances stimulate the planners, entrepreneurs and the policy makers to access the potential sites where industries can be established.
- **ii.** The basin region comes in a newly born state which requires perspective delimitation of industrial regions to know the past, present and future level of industrialization and trend of industrial performances in coming period.

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Data and Methodology

For the delimitation of the industrial regions secondary data has been collected from different offices of industrial concerns. The author has tried to delimit industrial regions with the help of "Deviation System Analysis Method" using severalindices i.e. percentageof workers in industry, number of industrial units and percentage of workers to total population of the Basin. The mean of all these indices indicates the level of industrialization which is caused by the multiple effects of the above indices or variables. The result obtainedfrom the study have been tabulated (**Table 2**) and plotted (**Fig. 4**)

Study Region

The Chhattisgarh Basin comprises of ten administrative districts namely, Bilaspur, Dhamtari, Durg, Janjgir-Champa, Kabirdham, Korba, Mahasamund, Raipur, Raigarh and Rajnandgaon (Fig: 1) covering an area of 68064 km^2 .The study area extends from 19^0 47′ North to 23 ^{0} 7′ North latitudes and 80 ^{0} 17′ East to 83 ^{0} 52′ East longitudes. The central location, extention and geographical significances (a part of peninsular India) has a correlation between the available resources and evolution of industries in the Basin.

The study region has huge varying resource potentials which could provide ideal locations for industries. The basin is overlaying on limestone, dolomite, sand stone, quartz of cuddapah period, dimension stone, Bauxite,iron ore,diamond (in kimberlitic rocks) and Dharbar rocks contains copper and the southern highland and eastern Kamur range of the basin have economically viable forest cover and inexhaustible different colours decorative stones of granite and gneiss(**Table 1**).The basin have highly fertile patch of black soil of Basna-low-land,Mahanadi-Seonath Doab Plain and have potential drainage system too which are the most revealing geographical features of the study region.

Findings

The result obtained from the study has been tabulated (Table:) and plotted in Fig: 2 . Four industrial regions have been identified to pursue better plan formation according to each region's level of industrial growth. The identified industrial regions are :-

1. Highly Industrised Region (Di > 1.50) 2. Medium Industrialised Region (Di. 0.75 – 1.50)
3. Low Industralised Region (Di. 0.50 – 0.75) 4. Very Low Industrialised Region (Di.< 0.50).

Industrial Scenario of Delimited Regions

The highly industrialized regions of the Basin (>1.50) comprise of Durg, Raipur and Bilaspur (Fig.1).The region have been named "The Trio Axis Region" by the author. The region possess 168 industries out of 224 existing Large Scale Industry (LSI) and Medium Scale Industry (MSI) in

the Basin, which is 75 % of the Basin industries (Table:).The highly industrialized region has given employment to 72 % of industrial workers of the Basin. The region possesses 100 % plastic and fiber industry,67.65 % agriculture and food processing industry, 77.28 % chemical and fertilizer and allied industry,50 % forest and forest based industry, 66.66 % cement, clinker and concrete articles industry ,92.59 % engineering and allied industry,36.37 % power and mineral processing industry of the Basin (Table 1).

Within this highly industrialized region there are4.6 % LSI and MSI industries lies in Raipur which give employment to 24 % of industrial workers of the Basin .The Durg district possesses 25.45 % of total existing industries in the Basin where 29 % industrial workers have been given employment, Bilaspur ranks 3rd which has 7.59 % stake of total existing industries where 19 % industrial workers have been employed (Table 2)

The individual group wise concentration of LSI and MSI in the Basin is also significant at industrial region wise within this highly industrialized region. Here 43.45 % steel and rolling mills and sponge iron mills, 44.48 % engineering and allies group industries, 13.69 % agro and food processing, 10.12 % chemical and fertilizer and 4.76 % cement industries have been established.

The level of SSI and artisan industries development in this highly industrialized region is also significant as 47.28 % of gross existing and artisan industries of the state lies here. The region also employs 58.20 % industrial workers.

Hence, the highly industrialized region possesses more mineral processing industries and down –stream industries of iron –steel, aluminium, cement, engineering and allies which are based on localized mineral resources. The food processing industries could be further targeted in this region.

The successful implementation of new industrial projects would critically depend upon the accessibility to newly invented resources pockets, involvement of private entrepreneurs to improve the commercial viability of the projects.

Medium Industrialized region of the Basin

The district of Korba, Raigarh and Janjgir-Champa constitutes this region (Fig.1) The deviation indices (Di.) is in between 0.75-1.50 in this region .The region has good potential of localized resources. It is located on south –Eastern-Central-Railways route and well connected with commercial cities of India. The districts of Raigarh and Janjgir –Champa have emerged as steel, power and cement hub. Since, 9th and 10th plans, to accelerate industrialization, two new industrial estates have been developed namely, Champa-Hatheora at Janjgir-Champa in 504.4 hectare area and at Lara in Raigarh in 1466 hectare area in this medium industrialized region. After the 5th plan period this region experienced excellent industrial development in LSI and MSI and SSI sectors. Till 5th plan period in Raigarh and Janjgir-Champa almost no LSI and MSI had

been established and their exploration and changed industrial policy, several MoUs have been signed to established steel and alloys and thermal power industries at Raigarh and cement and agro-processing units at Janjgir-Champa , Korba has been expended as aluminum and energy producing hub of this medium industrialized region (Fig.2).

The above progressive affords resulted in the evolution of 43 LSI and MSI industries which is 16.52 5 of the Basin. This region has also given employment to 45 % industrial workers of the Basin (Table: 4:26).In 56 years of Plan period 43.24 % (16) steel industries ,8.11 % forest and paper industries ,2.70 % (each) jute and textile and engineering ,2.38 % cement and allies industries ,100 % explosive industries,66.6 % aluminum industries ,63.6 % power industries and overall 18.92 % LSI and MSI industries of the Chhattisgarh state have been established in this medium industrialized region. This region ranks 2nd in the localization of cement industry (33.33 %) and steel casting and roll metal (17.98 %) in the Basin (Table:2)

In SSI sector 18.03 % industries of the Basin have been located, where 25.4 % of the total industrial workers of the Basin have been given employment.Out of gross existing SSI and artisan units in the individual group of industrial category handicraft and tools industry is (42.15 %) ,forest and allies industry (32.90 %),engineering and fabrication (17.89 %) ,
Ice and candy (24.07 %), bricks and tiles (21.96 %) etc. (Table 4).

Low Industrialized Region of the Basin

This region includes Rajnandgaon district of the State. The level of industrialization is low here. The Deviation indices (Di) is between 0.50 – 0.75 only. The region has less mineral resource exploration, recently some small patches of mineral deposits i.e. limestone at har-Bhata and hematite ore at Boria-Tibbu and Tumribore, quartz, talc, copper and ruddle (Geru) have also been explored in 9th and 10th Plan periods. The region has good potential of agriculture resources. An ideal location of this region on SEC Rail Route (Steel-Rail-Route) and on National Highway number six (The Great Eastern Road) makes this region the potential accessible region and “gate Way to Maharastra and Andhra Pradesh” Apart from the above the early industrialization is the advantage of this region as in 1892 the first ever LSI industry of the Basin was established at Rajnandgaon (BNC Mill).At present 4.9 % LSI and MSI of the Basin has been established where 16 % of the total industrial workers of the Basin are employed. Within this Low level industrialized region highest localization of LSI and MSI consists of agro processing and oil extraction industries. In SSI and artisan sector 1687 units have been localized here which gives employment to 9.52 % of the SSI and artisan sectors workers of the Basin. Within the low industrialized region the highest concentration of and artisan industries comprise of garment-tailoring and design (19.5 %) and forest and allied (18.55 %) (Table: 1).

Very Low Industrialized Region of the Basin

This region constitute of three districts of the Basin namely Dhamtari, Mahasamund and Kabirdham.The deviation indices (Di.) is < 0.50 so this is has been categorized very low industrialized region of the Basin (Fig:2).The region has least exploration of potential resources in spite of the availability of large forest produces, mineral resources and agro produces (Particularly cash crops and pulses and oil seeds).Out of total existing LSI and MSI localized in this region 75 % consist of agro and food processing and 12.50 % of forest based industries of the Basin. The Mahasamund and Dhamtari districts of this very low industrialized region possesses only 1.34 % (each) industries and Kabirdham only 0.89 % LSI and MSI industries of the Basin (Table 4).

Fig:1

Fig :2

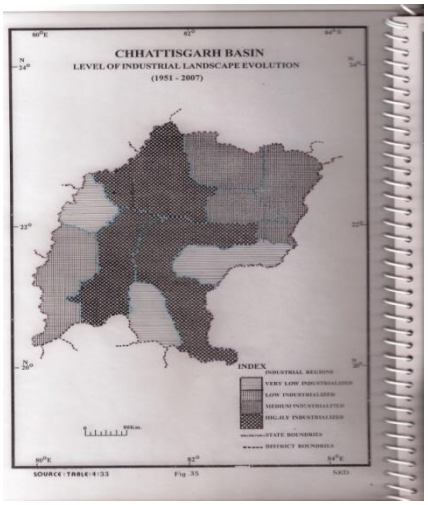
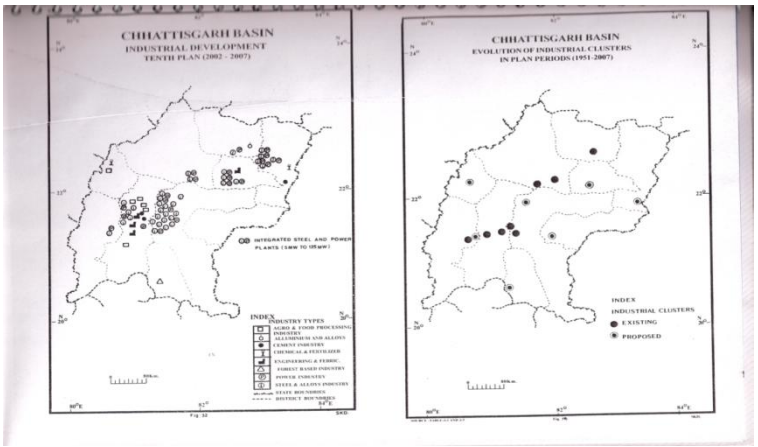


Fig :3

Fig. 4



Hence, the above delimitation of high, medium, low and very low industrial regions visualizes the status of industrial landscape development of the Basin in the 56 years of plan periods. In 56 years of

plan period maximum growth appreciation have been observed in steel and alloys industries (235 %),than in agriculture and food processing industries (166.66 %),in cement and allied industry(40.27 %) and in forest and paper industries (25 %) in chemical and fertilizer industry(24.6 %). Least industrial development has been observed in explosive and allied industries (12.50 %) whereas growth depreciation has been recorded in plastic and fiber and granules manufacturing units (-25 %) and there have been no change in the evolution of miscellaneous industries in this sector of industry the growth recorded (00.00 %).

Table: 1 Chhattisgarh Basin:Industrial Landscape Growth In Small Scaleand Artisan Industry

	INDUSTRIES								
Plan Periods	1 Agro Food Oil Extraction and Milk Process.	2 Bricks and Tiles	3 Chemical and Allies	4 Electric and Repair.	5 Engg. and Allies	6 Forest and Paper	7 Garment Tailoring and Design	8 Handi-craft and Tools	9 Ice and Ice Candy
1951-56	constant	constant	constant	constant	constant	constant	constant	constant	constant
1956-61	180.00	14.28	00.00	100.00	166.70	29.41	-37.50	100.00	00.00
1961-66	-21.43	-62.00	150.00	75.00	93.75	72.72	150.00	16.66	200.00
1966-69	-4.55	133.33	-20.00	00.00	-29.03	-23.68	24.00	14.28	-300.00
1969-74	177.77	833.33	100.00	285.71	116.12	113.15	108.00	228.57	66.67
1974-79	155.73	107.14	240.00	166.66	207.46	140.74	255.76	217.39	100.00
1980-85	171.15	62.06	64.70	91.66	36.89	166.66	380.00	247.94	40.00
1985-90	-0.71	-1.06	-31.03	5.79	-14.89	53.65	-14.75	46.45	21.42
1990-92	-53.80	-52.68	-17.50	-26.02	-28.75	-39.92	-36.32	-51.34	-82.35
1992-97	-6.10	93.54	85.00	155.47	53.33	31.03	73.57	-27.68	-23.52

1997-02	-50.98	-33.66	-36.48	-23.86	-50.81	-52.72	-54.87	-40.89	-23.07
2002-07	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Basin Mean Growth	49.73	99.47	48.60	75.49	50.06	44.63	77.07	68.28	-0.77
INDUSTRIES									
Plan periods	10	11	12	13	14	15	16	17	
	Leather and Leather Articles	Mineral Based	Plastic' Plastic Articles, Tyre Rubber	Print & Paper Photo Copy etc	Utensil	Miscellaneous	Total Nos. of Units in Plan Periods	Over all Growth in Plan Periods (+) / (-) Base Plan (1951-56)	
1951-56	constant	constant	constant	constant	constant	constant	101	Constant	
1956-61	200.00	100.00	200.00	00.00	100.00	53.12	159	+57.43	
1961-66	66.67	33.33	66.66	500.00	00.00	-30.61	199	+25.16	
1966-69	40.00	-800.00	-60.00	-20.00	-100.00	-11.76	188	-5.52	
1969-74	600.00	25.00	180.00	280.00	400.00	147.05	581	+191.95	
1974-79	277.14	370.10	121.42	342.15	100.00	214.29	1657	+185.19	
1980-85	121.21	40.42	74.19	-5.95	630.00	402.65	4560	+175.19	
1985-90	-20.20	78.79	94.44	46.83	-43.83	9.79	4472	-1.92	
1990-92	-62.66	-53.38	-39.04	-44.82	-85.36	-44.30	2525	-43.53	
1992-97	18.45	-21.90	-11.42	-21.55	-51.21	82.97	6288	+40.60	
1997-02	-48.18	25.61	-15.05	-23.07	5.00	-37.05	3577	-43.11	
2002-07	N.A	N.A	N.A	N.A	N.A	N.A	4497	+25.71	

Basin Mean Growth	108.40	-18.36	55.56	95.77	86.78	71.46	28804 Mean (2618.54)	50.59

Source: Directorate of Commerce and Industry, Raipur IN PLAN PERIODS (1951-2007) GROWTH IN %

.Table::2 Chhattisgarh Basin Industrial Landscape Growth In
Large And Medium Scale Industry In Plan Periods (1951-2007) Growth In Percent

	INDUSTRIES						
	1	2	3	4	5	6	7
Plan Periods	Agro Food Oil Extraction and Processing	Aluminum and Allies	Chemical Fertilizer and Allies	Cement and Cement Articles	Engineering and Allies	Explosive	Forest and Paper
1951-56	Base Plan	Constant	Do	Do	Do	Do	Do
1956-61	00	00	100	00	100	00	00
1961-66	00	00	100	100	100	00	00
1966-69	400	00	-200	-100	00	00	00
1969-74	-50%	100	100	100	-50	00	00
1974-79	-50	-100	00	200	-100	100	100
1980-85	300	00	50	-50	00	-100	100
1985-90	150	00	250	100	50	100	100
1990-92	-80	00	-71.42	-200	-100	50	-100
1992-97	00	00	50	300	200	100	300
1997-02	150	200	-33.33	-66.66	-83.33	-100	-300
2002-07	-20	200	-50	100	100	00	100
Basin Mean Growth	66.66	16.66	24.60	40.27	18.05	12.5	25

NDUSTRIES

District	8	9	10	11	12	13	14

	Power, and Mineral Processing	Plastic/ Fibers and Granules	Steel and Power Casting / Rolling / Ferro alloys / Ferro scrap	Textiles and Jute	Misc.	Total Nos. of Units in Plan Periods	Change in Percent over Previous Plan (+) / (-)
1951-56	Do	Do	Do	Do	Do	3	
1956-61	00	00	100	200	00	4	+33.33 %
1961-66	-100	00	-100	00	00	5	+25.00 %
1966-69	00	00	00	00	00	6	+20 %
1969-74	00	00	200	00	00	7	+16.66 %
1974-79	00	00	-50	100	00	10	+42.85
1980-85	100	00	-33.33	-100	00	16	+60.00
1985-90	00	100	100	100	00	34	+112.50
1990-92	00	00	-75	-100	00	9	-73.52%
1992-97	00	500	2000	100	100	48	+433.33%
1997-02	00	-900	-57.14	-100	-100	21	-56.25
2002-07	200	00	422.22	00	00	61	+142.85%
Basin Mean Growth	16.66	-25	235.18	25	00	18.66	+63.06%

Source: Directorate of Commerce and Industry, Raipur,2006,2007.

TABLE: 3 Chhattisgarh Basin : Industrial Regionalization , 1951-2007

Source: Directorate of Industry and Commerce, 2006-07, Raipur,

District	No. of Units	Industrial Employment	Capital Investment In Lakh of Rs.	% of Industrial Employee to total workers	% of Industrial employee to total population	Capital investment Per employee in Lakh of Rs.
Bilaspur	24357	191367	249785.96	19	6.11	1.30
Dhamtari	256	1003	705.00	15	0.03	0.70
Durg	21718	131875	158739.00	29	2.85	1.20
Janjgir-Campa	1304	13523	92783.00	10	0.45	6.86
Kawardha	603	1566	1318.37	07	0.10	0.84
Korba	813	22267	38024.35	25	1.30	1.70
Mahasamund	216	4501	1404.00	12	0.30	0.31
Raigarh	11440	37253	76322.96	16	0.67	2.04
Raipur	23857	94332	450168.09	24	0.89	4.77
Rajnandgaon	6157	28626	9847.66	16	0.29	0.34
Regional mean	9072.1	52631.3	99487.2	17.5	1.33	2.00

Census of India, C.G. Series-22, 2001.

Table:3a Chhattisgarh Basin: Deviation Indices*In Paln Periods 1951-2007

District	No. of Units	Industrial Employment	Capital Invest-ment	% of Industrial Employee to total workers	% of Industrial employee to total population	Capital invest-ment Per employee	Level of Industrialization Average (Li) **(a+b+c+d+e+f) / 6**
	n	n	n	n	n	n	**Di = n / Li ×g**
Bilaspur	2.68	3.60	2.51	1.09	4.59	0.65	2.52
Dhamtari	0.03	0.01	0.007	0.86	0.02	0.35	0.21
Durg	2.39	2.50	1.60	1.66	2.14	0.60	1.82
Janjgir-Champa	0.14	0.26	0.93	0.57	0.34	3.43	0.95
Kawardha	0.07	0.03	0.01	0.40	0.08	0.42	0.17
Korba	0.09	0.42	0.38	1.43	0.98	0.85	0.69
Mahasamund	0.02	0.09	0.02	0.69	0.23	0.16	0.20
Raigarh	1.26	0.71	0.77	0.92	0.50	1.02	0.87
Raipur	2.63	1.79	4.51	1.37	0.67	2.39	2.23
Rajnandgaon	0.68	0.54	0.10	0.91	0.22	0.17	0.44

*Based on Deviation System Analysis Method (DI)

Table: 4Chhattisgarh Basin: Location Quotient Of Individual Industry Group, 1951-2007

3	Location Quotient In each Individual Group of Industry in the Basin (**Q)**									
	$Q = Z / Z^1$									
% of industrial employment in Basin to the total employment	Agro-Food Process	Alu-minum	Cement	Chemical & Fertilizer	Forest Based	Jute, Textile & Garments	Plastic & Nylon Article	Steel Alloy Sponge Iron, Engg, Wires	Powe r & Coal	Misc.
Z^1 =17. 5	**17. 5**	**17. 5**	**17. 5**	**17. 5**	**17. 5**	**17. 5**	**17. 5**	**17. 5**.	**17. 5**	**17. 5**
District										
Bilaspur	0.50	0.00	0.00	0.99	2.22	1.02	0.00	0.17	5.30	1.13
Dhamtari	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Durg	1.06	0.00	1.71	1.00	0.00	0.00	0.00	4.11	0.05	1.75
Janj-Champa	0.00	0.00	1.86	0.00	1.60	0.00	0.00	0.08	0.00	0.00
Kabirdham	0.43	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Korba	0.00	5.71	0.00	0.00	0.00	0.20	0.00	0.006	0.28	0.80
Mahasamund	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Raigarh	0.04	0.00	0.15	0.11	0.62	1.20	0.00	0.33	0.16	0.00

Raipur	1.11	0.00	1.96	1.68	1.26	3.28	5.71	0.96	0.00	0.08
Rajnandgaon	1.27	0.00	0.00	1.89	0.00	0.00	0.00	0.04	0.00	1.82

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Train To Pakistan And Toba Tek Singh: Two Portraits Of A Mad Moment

Dr.R.P. Singh

Abstract

The tragic partition of India at the time of independence was human lunacy masquerading as multiple identities of religion and political ideology. It was sort of a neurosis which affected the continent on a mass scale.

This lunatic moment was captured by some of the greatest sensitive-creative minds of the time in their works of art and literature. Their authenticities have turned these works into immortal socio-psychological documents of a tortured segment of the human history.

Among the literary artists who took from the Partition the thematic aspects of their creations, Khushwant Singh and Saadat Hasan Manto are the foremost. The larger canvas of Singh's novel *The Train toPakistan* and the smaller but more intense canvases of several short stories of the Urdu writer (translated into all the world languages including English), Manto take us, in their differently fascinating ways, into the complex mindscapes of the forces operating during that cataclysmic portion of our history as a nation.

Keywords: Partition,India,Pakistan,Community,Politics

Introduction

> 'Just because you do not take interest in politics it doesn't mean that politics will not take interest in you'--- a Roman emperor

'…Saadat Hasan Manto…hates the bright sun, preferring dark labyrinths. He will not go near running waters, but loves to wade through slush. Where others weep, he laughs; where they laugh, he weeps'--- Manto'I had believed that we Indians were peace-loving and non-violent, that we were more concerned with the matters of the spirit.

After the experience of the autumn of 1947, I could no longer subscribe to these views'--- Khushwant Singh

Saadat Hasan Manto, the famously controversial Urdu short stories writer, and Khushwant Singh are arguably the most significant witnesses to the Partition violence. In a paradoxical way, several of Manto's short stories and Singh's *Train to Pakistan* have borne anticipatory witness to the recurrent subsequent outbreaks of communal-sectarian conflicts which India stands prone to in an utterly unfortunate but undeniable way, even after nearly seven decades of the originary mad

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moment. The chief strength of these two intensely humanistic but unsentimental mappers of the communal mindscape lies in their creative courage and honesty to look deep into the recesses of that lunacy. This has made their works into a sort of area- classics meaning simply that they refuse to be dated. Their sketches and portraits immediately rise up in our minds whenever we confront the 'demon' who, too, is persistent in his refusal to die and vanish. At the press conference after the screening of Pamela Rook's film version of the novel at the International Film Festival in Delhi (11-20 January 1998) Khushwant Singh remarked into the future that 'We must not forget the partition because it is relevant today. We must remember that it did in fact happen and can happen again….Reminding ourselves of what happened in 1947 and realizing the possibilities of its recurring, we should resolve that we will never let it happen again'. This looking into the future with despair and hope is shared by the vast sane population of the Indian sub-continent. Despair at the dark possibility that the 'demon' will rise again and again because it lies actively dormant, and hope and wish for his final and permanent burial in the regeneration of rational humanity.

Discussion

At the deeper level, *Train to Pakistan* is a novel which is an anguished cry over the psychological fact of the failure of reason under the pressure of the activation of real or rumoured 'ancient' bonds and their violations. The long-established and flourishing fellow feeling of the cheerful Mano Majrans gets disturbing jolts from the news of communal violence in Bengal and some locations of Punjab. The villagers try to fight the initial disturbance in their minds by assuming that God is punishing them for their sins, but it acquires intensity as the time passes. Their happily staid train -consciousness is punctured as the passenger trains lose their punctuality and the goods trains stop coming. The disturbance turns into bewilderment when, one morning, a 'ghost' train loaded with butchered corpses of Sikhs and Hindus arrives from Pakistan at the village railway station to dump them for mass cremation. The villagers are not allowed to go toward the station, but the hideous truth comes to light by the night. The novelist captures the outer hideousness in apt images of colour and smell:

The northern horizon, which had turned a bluish gray, showed orange again. The orange turned into copper and then into a luminous russet. Red tongues of flame leaped into the black sky. A soft breeze began to blow toward the village. It brought the smell of burning kerosene, then of wood. And then--- faint acid smells of searing flesh (100).

The breeze takes the 'acid smell' into the Mano Majrans' minds--- 'No one asked anyone else what the odour was. They all know. *They had known it all the time*. The answer was implicit in the fact that the train had come from Pakistan' (ibid. The italics added to emphasize the buckling of rationality).They 'barricaded' their mind –doors, talked in whispers among themselves, feeling their neighbor's hands against the, and longed for 'finding friends and allies' away from those with whom they had spent 'ages' without any suspicion. The bond of fraternal feelings got

ruptured, resulting into Mano Majra being dived 'into two halves as neatly as a knife cuts through a pat of butter' (141). The other half of Mano Majra,too, has sunk into suspicion, The stories about how Muslims were massacred and their women stripped and raped in market places began to strike and haunt their minds. To them every Sikh of the village looked like a stranger with an evil intent, and so was to be suspected. 'For the first time, the name Pakistan came to mean something to them--- a heaven of refuge where there were no Sikhs' (ibid.).

We know that every serious literary text has a dramatic centre which is structured by a specific psychic content. This centre in *Train to Pakistan* is constituted by the hovering question---why is it that that the communal-sectarian feelings overtake and overthrow the fraternal-friendly relationships among the people belonging to different religious denominations? Why do people suddenly lose their sanity of constant living with warm fellow feeling and drown themselves into fear, suspicion and hatred toward one another on the basis of religion and community. Khushwant Singh,being a artist, does not attempt a psychoanalytical answer. He just portrays the problem through his convincingly realized characters and leaves the reader with the message that one should transcend the religio-communal divide and get salvation through action and sacrifice for love, as the 'budmash number ten' Juggat Singh achieved, at the end of the novel, by paving the way for the train to move on safely to Pakistan with his Nooran and thousands of others on board. Pain, loss and bewilderment mark the narratives which try to capture the psycho-social devastation that accompanied the traumatic events of the partition.Khushwant Singh and Manto are the two greatest among those who turned those traumas into works of art for the posterity to feel them with the required level of intensity. The authenticity of these 'documents' is such that even the social scientists think it superior to the truth contained in the official archives. Ayesha Jalal writes,

Long before I made the 'error' of looking at the first document stored in official archives, the searing experience of the Partition had been conveyed to me through Manto's stories…. The pain of these stories of rapes, abductions and murders persuaded me of the need to understand the causes of Partition and its horrors and not simply echo in historical non-fiction what had been so graphically portrayed by the more sensitive creative writers and artists (Jalal 1996:93-104).

Khushwant Singh and S.H. Manto were dispassionate creative artists who believed that '… literature gives news about the nation, the community to which it belongs, its health, its illness. Stretch your hand and pick up any dust-laden book from an old shelf—the pulse of a bygone era will begin to beat under your finger-tips' (Manto quoted in Narang 1997:72).There were some other notable witnesses of that mad moment ,specially the poets, who did not maintain the dispassionate distance from the tragedy. The pained bewilderment at the dream of independence turning into the partition nightmare was expressed in memorable poetry by the great Urdu poet Faiz Ahmed Faiz in his Subh-e-Azadi: '*Yeh daghdar ujala yeh shab gazida Sahr,wo intizar thajiska wo yeh sahr to nahin*' (This stain-covered day-break, this night- bitten dawn. This dawn is not that dawn we craved for—S A I Tirmizi,The Paradoxes of Partition 1937-

47). Such poetic sadness sentimentalises the trauma which was actually man-made, arising out of the 'false' ground of religious identity and horrific in the display of human bestiality. Clearly a pathological case which demanded a detached treatment. The data of the case boggle the mind: over one million people lost their lives, hundreds of thousands of children were lost and abandoned, between 75,000 and 1, 00,000 women were raped and abducted apart from the families that were torn apart.

What *Train to Pakistan* and Manto's *Siyah Hasiye* (Black Margins, the short story Toba Tek Singh forms a part of this collection) achieve is the unsentimental depiction of the psycho-social traumas caused by that hellish horror. This unsentimentality and detachment is more pronounced in Manto than in Singh. It is well known that despite his affiliation with the socialist realism-leaning Progressive Writers Movement, Manto moved away from traditional realism because his basic purpose of writing fiction was not to describe but to investigate, and through investigation, create 'explosions in readers' minds' .For this he maintained a proper critical distance from his subject-matter. He appears to have accepted the nightmare without self-pity or despair. His relentless individuality led him away from the beaten path of traditional fiction writing norms to the trial of various writing strategies. The result was a Manto oeuvre which posed a problem for the critics when they tried to define and label the individual stories. His restlessness to search, experiment and express was rooted in the revolt what raged in his mind. He has said, 'The partition of the country and the changes that followed left feelings of revolt in me…. When I sat down to write, I found my thoughts scattered. Though I tried hard, I could not separate India from Pakistan and Pakistan from India…. *My mind could not resolve the question: what countrydid we belong to now--- India or Pakistan*? (quoted in Mahey 2001:153,the italics added to underline its centrality to the Toba Tek Singh problem).

The theme of identity crisis and madness recur often in the Partition discourse, whether conventional history writing or fictional representation. The source of the bewildered identity crisis is the disbelief in the 'rumour and hearsay' that religion can divide human beings. The writers not only reject religion as the basis and cause for separation, they highlight and celebrate the composite culture of united India. The entire range of literary reaction that the partition received ---from Saadat Hasan Manto to Bapsi Sidhwa, Rahi Massom Reza to Kamleshwar, Khushwant Singh to Shashi Tharoor--- is shot through the twin themes of the 'age-old' bond of village kinship and a nostalgic celebration through invocation of the symbols of unity and humanism observed by the people even during the times of the horror.

Manto stands out for the starkness and bleakness of his stories which capture the partition madness through their psychologically abnormal-normal characters.*Toba Tek Singh* is set two or three years after the partition and was first published in 1955,coincidentally, the year which saw the publication of Singh's *Train to Pakistan.* The plot is simple. As a part of bureaucratic formalities in connection with the partition, the exchange, along communal lines, of lunatics living and getting treatment (*to become sane*) in the mental asylums of the erstwhile India is

taking place. One of the madmen,Bishan Singh (who is named with bureaucratic coldness Toba Tek Singh after his village of that name), refuses to be relocated, climbs up a tree, insists on remaining on that tree, is brought down from it and is left on the border where he dies as a lonely man. The land on which he breathes his last is no man's land, neither India nor Pakistan. Where does Manto,the unique *afsaana nigaar* (short story writer) enter into this simplicity? In the very beginning where he starts to create an imaginative world of his own, making us feel that we are entering into the Mantoesque world of deeper psychological realities manifesting themselves without the trappings of conventional depiction. He casts a spell through weaving a web. Right from the first paragraph, we know that we are in the fictional-real world of Saadat Hasan Manto. He deploys a narratorial tone 'which is both jauntily oblique and directly matter-of-fact at the same time' (Trivedi 2012: 63-73). The story strikes us as today's news, its pain and truth not blunted by the years. In this world, history is not abstract or 'realistically' official; it lives in the shape and skin of Bishan Singh who prefers to die in no man's land to living in a country where borders can spring up overnight. In Manto's world, *Khol Do* (Open It), we meet timeless history in the girl who is raped so often that she has become conditioned to pulling down her salwar and spreading her legs like a zombie even though it is her distraught father who has come to see her, in the Hindu woman (*Do Kaumen*--- Two Communities) who rejects her Muslim lover because he insists on her religious conversion before marriage, in the strong and virile man who loses his potency after discovering that the to-be- raped girl had already died on his shoulder (*Thanda Gosht*—Cold Meat).

Toba Tek Singh is a piece of great literature because, while writing history, it eloquently hints at the unnamed guilt and shame of it all.In its human embodiments of history it grapples with the possibility--- and impossibility--- of coming to terms with partition,borders,maps insiders outsiders, us and them. It does this by insisting on the absurdity of the necessity to name places with the purpose of explaining what they are and how they came to be. The lunatics in the asylum are confronted with the bewildering but inescapable question: what is Pakistan? After the ritual of naming comes up the issue of location: where is Pakistan located? The answerless questions dislocate Bishan Singh and his fellow inmates literally as well as at the most fundamental level of the essential sense of belonging. They do not understand the idea behind their being shifted. They ask a simple question: 'If they were in India, where on earth was Pakistan? And if they were in Pakistan, then how come that only the other day it was India' (83)? The 'sane' solution which comes to the 'insane' mind of the hero is to climb up a tree and declare that he wants to live just there--- neither in India nor in Pakistan. The fundamental crisis of identity and location is resolved by the subversion of the received conventional idea of sanity and insanity. For the readers the sane appears to be insane and vice versa. It is a measure of the uncertainty of the times that even the names of the people do not stay fixed. But the bureaucratic formalities of division, shifting, relocating and renaming have to be completed without any loss of 'precious'

time. Bishan Singhis renamed, in a bureaucratic huff, Toba Tek Singh after the name of his village, a village no one is quite sure where it is--- in India or Pakistan.

This story conveys the chilling irony of the statist efforts to establish control over the rooted mixed populations in the wake of the arbitrary division of the indivisible. The affected humans, represented by Toba Tek Singh, find the rational calculus based on demographic measurements used by the bureaucrats and planners as absurd, incomprehensible and mad. He expresses this incomprehensibility through disconnected nonsense phrases which square up the complete breakdown of communication between the two sides. He utters in incomprehension---'opad the gur gur the annexe the bedhyana the mung the dal of the Pakistan and Hindustan dur fittey moun'(87).This 'non-sense' language fully articulates the madness and illogicality of what he is living through. The centre of this articulation is the clear and passionate resistance to the idea of partition which was a result of the long colonial-communal gestation effected by the British rule, and its acceptance by the native English-speaking sahibs. It is notable that Manto uses English expressions and an apparently meaningless blend of Urdu-English gibberish in some of his stories to score an effect of satiric humour. In '*Babu Gopinath*' we find words and phrases like 'anti ki panti po', 'continutian'', 'continutally' and 'tin pipti fil fil foti'. But the gibberish of Toba Tek Singh falls in a class of its own. It is an act of defiance and resistance through mimicry, not a desire to sound and look like the colonizer or the metropolitan. He defies not only the British arrangement of dividing the country, but also its meek acceptance by the English- speaking Indians. It is an eloqsuent rejection of the new borders

Conclusion

Train to Pakistan and *Toba Tek Singh* are two of the finest examples, in Indian literature, of socially engaged literature. They both affirm, in the words of Alok Bhalla, 'the survival of the moral being in the midst of horror' (quoted in Gyanendra Pandey 2001:62). Their writers seem to believe in the existentialist idea that there is no cosmic purpose of life. The meaning of a person's life lies in what he gives to his life through concrete actions. Their characters do not deliver speeches, complain about the world's cruelty and indifference, or attempt any grand solution through things like renunciation of worldly things, even in situations of the horror of Partition.Juggat Singh takes charge of his derailed life and saves the train through death in action and Toba Tek Singh recovers his sanity through his rejection of the idea of the country's partition. The two texts, one in the expanded framework of a novel and the other in the intensely economical frame of a short story, one set in an 'ordered-disordered' village and the other in an urban 'disordered-ordered' mental asylum, deal with the most traumatic episode of the history of the Indian sub-continent. Their juxtaposed reading illuminates each other and rewards our understanding of that madness.

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E-Commerce- Business Issues, Security Issues And Consumer Protection

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Abstract

Economic activity done online is known as E-commerce. It include all types of business activities like retail business, banking and insurance business, investing and rental business etc. With the advent of Information & Computer Technology (ICT) there is a boom in e-commerce activities worldwide. Most of the businesses are now adopting e-commerce as a IT tool for expanding their cliental, reducing operational cost, improved efficiencies and increased profitability. Ecommerce is constantly changing and evolving with new technology and changes in consumer behaviour. It's increasingly becoming more sophisticated and mobile. E-commerce has many advantages, which may be classified as advantages to business, consumer and society at large. However it suffers from few limitations, major are the security issues of online transactions. The present paper is an attempt to analyse the advantages, limitations and the security issues, business issues in relation to widely adopted e-commerce activities and consumer protection for the same.

Key words: E-business, Business Issues, Security issues, Consumer Protection of e-commerce.

Introduction

The various changes in the IT sector over the last two decades has given emergence of e-commerce. Electronic commerce is the process of buying, selling, transferring or exchanging products, services and or information via computer networks, including the internet. E commerce is defined in various perspectives like communications, commercial, business process, learning, service, collaborative, community, etc. Electronic commerce, or e-commerce, refers to economic activity that occurs online. E-commerce includes all types of business activity, such as retail shopping, banking, investing and rentals. A variety of commerce is taking place via e commerce which draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. There is a massive increase in the trade level through e-commerce since the advent of internet . Modern electronic commerce typically uses the World Wide Web at least at one point in the transaction's life-cycle, although it may encompass a wider range of technologies such as e-mail, mobile devices social media, and telephones as well. Most often it is observed that e-commerce is confused with that of

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e-business. E-business is a broader term of ecommerce which included not only the buying and selling of goods and services, but also servicing customers, collaborating with business partners, and conducting electronic transactions within an organization.

The key players are consumers and sellers. It involves visit of website,selecting a product, selecting payment options, usage and availability of credit card, e-banking, order placement, money realization and dispatch of goods or services to the customer.

E-commerce is subdivided into these categories:

- Business to- Consumer (B2C)
- Business to- Business (B2B)
- Consumer-to-Consumer (C2C)
- Business-to-Government (B2G)
- Mobile commerce (M-com)

E-commerce Security is a part of the Information Security framework and is specifically applied to the components that affect e-commerce that include Computer Security, Data security and other wider realms of the Information Security framework. E-commerce security has its own particular nuances and is one of the highest visible security components that affect the end user through their daily payment interaction with business. And there is need for development of a number of ecommerce protocols, which ensure integrity, confidentiality, atomicity and fair exchange (Saini 2012).

E-commerce encompasses the entire world of electronically based organizational activities that support a firm's market exchanges—including a firm's entire information system's infrastructure (Rayport and Jaworksi, 2003). Others argue, on the other hand, that e-business encompasses the entire world of internal and external electronically based activities, including e-commerce (Kalakota and Robinson, 2003). As per a survey online consumer sales expanded by more than 23% in 2005 to an estimated$142–$172 billion (eMarketer, Inc., 2005a; Shop.org and Forrester Research, 2005).Of the total 112 million households in the United States, the number online increased to 71 million or 63% of all households (U.S. Census Bureau, 2005;eMarketer, Inc., 2005b; Pew Research Center, 2005).

B2B e-commerce—use of the Internet for business-to-business commerce- expanded about 30% in 2005 to more than $1.5 trillion (U.S. Department of Commerce, 2005). The Internet technology base gained greater depth and power, as more than42 million households had broadband cable or DSL access to the Internet in2005—about 38% of all households (e Marketer, Inc., 2005c).

Advantages of E-Commerce

The advantages to consumers on account of e-commerce and the opportunities of e-commerce to the business may be listed as follows:

- New business opportunities, new products and new services.
- Greater efficiency and low costs.
- Mass customization and personalized products and services.

- Enhanced quality of service.
- World wide access and innumerable choices of products and services.

Apart from the above the following table will bring out a better understanding of advantages of ecommerce to the consumers as well as the society at large.

Benefits to consumers	**Benefits to society**
▪ Electronic commerce enables customers to shop or do other transactions 24 hours a day, all year round, from almost any location. ▪ Electronic commerce provides customers with more choices ;they can select Electronic commerce frequently provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons. ▪ In some cases, especially with digitized products, EC allows quick delivery. ▪ Customers can receive relevant and detailed information in seconds, rather than days or weeks. ▪ Electronic commerce makes it possible to participate in virtual auctions. ▪ Electronic commerce allows customers to interact with other customers in electronic communities and exchange ideas as well as compare experiences. ▪ Electronic commerce facilitates competition, which results insubstantial discounts.	▪ Electronic commerce enables more individuals to work at home and to do less traveling for shopping, resulting in less traffic on the roads and lower air pollution. ▪ Electronic commerce allows some merchandise to be sold at lower prices, so less affluent people can buy more and increase their standard of living. ▪ Electronic commerce enables people in Third World countries and rural areas to enjoy products and services that otherwise are not available to them. ▪ This includes opportunities to learn professions and earn college degrees. ▪ Electronic commerce facilitates delivery of public services, such as health care, education, and distribution of government social services at a reduced cost and/or improved quality. ▪ Health-care services, for example, can reach patients in rural areas.
(Source: compiled from lecture notes of Rai University)	

Limitations of E-Commerce

The limitations of e-commerce can be grouped into technical and non technical categories:

Technical Limitations	Non-technical Limitations
✓ There is insufficient telecommunication bandwidth. ✓ The software development tools are still evolving and changing rapidly. ✓ It is difficult to integrate the Internet and EC software with some existing applications and databases. ✓ Vendors may need special Web servers and other infrastructures, in	✓ Security and privacy These issues are especially important in the B2C area, especially security issues which are perceived to be more serious than they really are when appropriate encryption is used. Privacy measures are constantly improved. ✓ Lack of trust and user resistance Customers do not trust an unknown faceless seller (sometimes they do not trust even known ones), paperless transactions, and electronic money. So switching from physical to virtual stores may be difficult. ✓ Other limiting factors. Lack of touch and feel online. Some

addition to the network servers. ✓ Some EC software might not fit with some hardware, or may be incompatible with some operating systems or other components. ✓ As time passes, these limitations will lessen or be overcome; appropriate planning can minimize their impact	customers like to touch items such as clothes and like to know exactly what they are buying. ✓ Many legal issues are as yet unresolved, and government regulations and standards are not refined enough for many circumstances. ✓ Electronic commerce, as a discipline, is still evolving and changing rapidly. Many people are looking for a stable area before they enter into it. ✓ There are not enough support services. For example, copyright clearance centers for EC transactions do not exist, and high-quality evaluators, or qualified EC tax experts, are rare. ✓ In most applications there are not yet enough sellers and buyers for profitable EC operations.
(Source: compiled from lecture notes of Rai University)	

Facts, figures and shopping online statistics:

Reports say that almost 90% of the businesses today are connected to the internet. This inturn is a direct basis for the growth and development of electronic trade. The number of internet users are on the increase today. Certain research reports say that most of the internet users use internet facility for obtaining information only , but the real statistics depict the number of online buyers on the increase. Research reports also say that the share of the electronic trade in the complete retail sales is reaching more than the forecasted figures.

Online shopping and ecommerce is a huge multi billion dollar industry and is expected to grow by 20% this year to $1.5 trillion globally. The following is a research finding on online shopping of a research study.

1. 71% of shoppers believe they will get a better deal online than in stores
2. 80% of the online population has purchased something using the internet, 50% of the online population have purchased more than once
3. Online sales in in the first quarter of 2014 were up 13% compared to same quarter 2013 (source: Custora's E-Commerce Pulse)
4. Mobile ecommerce was up 35% compared to last year for the first quarter of 2014, and increased its share of online sales. First quarter in 2014 mobile
5. ecommerce was 18.5% of total ecommerce sales compared to 13.7% for same time last year (source: Custora's E-Commerce Pulse)
6. Cyber Monday 2013 was the biggest online sales day of all time with US$1.7 billion spent (source: Statista)
7. Gen X spends $561 on average online, 15% more online than Gen Y who spend $489
8. 36% of consumers spend 30+ minutes comparison shopping before making a decision on purchasing a commodity product; 65% spend 16+ minutes doing so
9. 46% of users read reviews and blogs before purchasing online.

10. blogs influence purchase, 13% said they a blog post had inspired a purchase
11. 84% of online shoppers refer to at least one social media site for recommendations before shopping online

Business Issues in today's online shopping :

The following are the problems that frequently encounter in the online shopping through e-commerce in today's business.

- Consumer is not able to contact the merchant.
- There is a frequent usage of abusive clauses.
- Limited information disclosure
- The contract is made perfect by a simple press of a single button in the key board.
- There is a frequent use in the modality of adhesion contracts or contracts that are signed on the basis of general contract conditions.
- There is absolutely no knowledge to a consumer where any suit has to be filed and the procedure thereto if there arises any legal problems.
- Technological scams.
- False and misleading conduct of the supplier during the trade.
- Failure of delivery , delayed delivery.
- Consumer can however file a case against the merchant for all the above issues. But it works out very time taking and a bit costly for a consumer to be behind.
- Unenforceability issues.
- Increased risks of commercial exploitation of minors.
- Increased unauthorized use of electronic devices leading to privacy risks, data security breaches, etc.

Security Issues

E-commerce security is the protection of e-commerce assets from unauthorized access, use, alteration, or destruction.The technology used for e-commerce is more complex and as such the chances of intrusion and attack has increased manifold in the recent years. Most of the pc users are under the impression that their computers are safe from online threats but lack basic protection against viruses, spyware, hackers, and other online threats**.** Most of us cannot forget 17th November, 2003, phishing attack. A high tech scam that used e-mail, pop-up messages, or web pages to trick a user into revealing sensitive personal information like credit card details, number, bank account number, passwords, etc. A number of e-bay customers were sent e-mail with a message that their accounts were restricted. This message had a hyperlink to an eBay web page where they could do the re registration. All that they had to do was to give their personal information like date of birth, mother's name, ATM personal identification numbers, credit card information, etc. But the real story was that eBay has not sent any e-mail to its customers of such restrictions in the account. Customers who reregistered believing that the page was an

authentic from that of eBay and it was containing eBay logo became the victims of the phishing attack. It was actually a bogus site which was run by internet scammers. It is said that there are lots of teenage hackers, corporate insiders, foreign government agents, spies and even criminal agencies who take advantage of technology through e-commerce. Also there are evidences from security surveys which provides us a clear picture of the various cyber crimes and cyber attacks in e-commerce. Technical attacks are one of the most challenging types of security compromise an e-commerce provider must face. Problems in electronic commerce is more as there is no face to face contact. Detection becomes difficult. Easy negotiability of documents are not possible. The electronic system that supports e-commerce is exposed to abuse and failure like financial loss directly, damages to the key customer or a firm, high risk of theft of confidential, proprietory, technological or marketing information to the customer or a firm and heavy losses in business or inconvenience to the customers.

One may find so many corporate conducting security audits and employ different technologies and procedures to defend against cyber crimes and attacks. Still there arises a lot of questions in one's mind how honest or trustworthy will the web owner in sharing our personal information to others. Also there is no guarantee that the network connection is free from eavesdropping. Another security issue is that the information provided by the customer itself whether authentic or not is not known by the company.

While security features do not guarantee a secure system, they are necessary to build a secure system. As per Niranjanmurthy (2013) security features have the following categories:

- Authentication: The process by which one entity verifies that another entity is who he, she or it claims to be. Verifies who you say you are. It enforces that you are the only one allowed to logon to your Internet banking account. In other words, it is making sure that message senders or principals are who they say they are.
- Authorization: Allows only you to manipulate your resources in specific ways. The process that ensures that a person has the right to access certain resources. This prevents you from increasing the balance of your account or deleting a bill.
- Encryption: Deals with information hiding. It ensures you cannot spy on others during Internet banking transactions.
- Auditing: The process of collecting information about attempts to access particular resources, use particular priveleges , or perform other security actions. Keeps a record of operations. Merchants use auditing to prove that you bought a specific merchandise.
- Integrity: prevention against unauthorized data modification. Making sure that information is not accidentally or maliciously altered or corrupted in transit. As applied data, the ability to protect data from being altered or destroyed in an unauthorized or accidental manner.
- Nonrepudiation: prevention against any one party from reneging on an agreement after the fact. Ensuring that principals cannot deny that they sent the message. The ability to

limit the parties from refuting that a legitimate transaction took place, usually by means of a signature.

- Availability: prevention against data delay or removal
- Firewalls: a filter between corporate networks and the internet to secure corporate information and files from intruders, but allows access to authorized principals.
- Confidentiality: knowing who can read the data and ensure that information in the network remains private and safe. This process is done through encryption. Keeping private or sensitive information from being disclosed to unauthorized individuals, entities or processes.

Most of the organizations, depend on the multiple technologies to secure their networks like **access control** which is a mechanism that determines who can access or officially use the network resource, **biometric systems** which is an authentication system which identifies a person by measurement of his finger prints or eyes, voice or facial features, etc. Storage devices that contains a secret code used in two factor authentication system called **passive tokens.** Small, stand alone electronic device that generates one time pass word used in a two factor authentication system (normally used by banks) called **active tokens.**

Consumer Protection :

e-commerce is based on the customer's freedom to choose between the alternatives . This freedom of the customer is subject to known and unknown threats. As such there are many laws to protect the rights of consumers. The consumer laws protects consumers from sellers and advertisers who affect the rights of the consumers.

Why Consumer Protection ?

Consumerism is all about protection of interest of consumers of goods and services against defective or dangerous goods. Also in a consumer market, a consumer may usually be confronted with issues like information deficiencies, after sales difficulties, fraud and unethical conduct of business, problems with privacy issues, making payment through the use of internet, etc. So is the need for consumer protection act.

E-Commerce In Consumer Protection:

Despite the various security issues associated with e-commerce, research studies prove that the better the web site security is the more protected web consumer is. There is a positive relationship between the customer service quality and online customer protection. There is also a positive relationship between online customer protection and attitude in internet shopping. Website information quality is negatively related to online customer protection.

ECSG – Electronic Commerce Steering Group is helping to protect consumers from fraudulent and deceptive practices while buying and selling online. In the year 2002, ECSG took an exercise of APEC economies and their approaches to data privacy also. APEC- Asia Pacific Economic Cooperation is a forum for 21 pacific rim member economies that promotes free trade throughout the asia pacific region.

Suggestions And Precautions For E-Consumers:

- Learn about merchants. Know details from feed back systems and ratings from other buyers.
- On completion of the transaction, SMS alert is received from the banker. Monitoring the bank statement, report should be made to the bankers in case of any fraudulent transactions that took place.
- To always have a print copy record of purchase order with order confirmation number, etc.
- To have an exclusive credit card for online shopping and purchases.
- It is always better to shop with the companies that consumers are aware.
- Always to keep personal information like pass words, etc totally private.
- It is always better to use a secure browser.

For Merchants:

- To prevent online fraud is a vital task for every e-merchant as quite often we find the users are very reluctant to give their card details online as they consider it very personal and sensitive.
- The general public should be made aware of all the e-commerce laws by the government.

Conclusion

By the application of the biometric technologies to authentication to some extent this issue may be curbed. Lot many customer experiences should be shared among social networks which will create further awareness of the various cyber issues and attacks. E-commerce has proven to be very advantageous for business and consumers. For its wide acceptance it should be designed simple to use, fast and user friendly. It should be standardized so that wherever the solution is used the customer is familiar with the procedure followed. It has, over the number of years, proved as a vehicle to boost up international trade and international business e.g.in European Union, North American and other developed nation like Japan, Singapore, and Hong Kong etc. Indian business is also adopting e-commerce in a phased manner. Since the world has turned into a global village after everything has turned towards digitalization, there is tremendous scope for expansion of business and for maximizing the profits. Thus we should try to overcome all the barriers and try to develop such environment that is favorable for the development of E-commerce.

Consumer protection in e-commerce is essential as it will help eliminate uncertainities or difficulties to both the consumers and businesses at the time of buying and selling online thereby

help online commerce in global market place to reach its heights. Government has a major role to play in providing a legal framework properly for e-commerce so as to ensure privacy, intellectual property, and prevention of fraud, consumer protection etc are duly considered with. To conclude, one can say consumer protection in e-commerce will not only ensure developed India but also an industrialized India, too.

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Computation of Optimal Solution of Certain Linear Form of Problem through Fixed Point Algorithm

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Abstract

In this paper we have tried to compute solution of some specific linear types of decision problem in R^2 through the fixed point algorithm. The optimal solutions of such problems have already been known by using other technique based on simplex methods of linear problem. The fixed point algorithms applied to these problems are based on the process of triangulation as well as labeling of triangulation developed by Eaves and Saigal as a refinement of scarf work is much more efficient and quick to determine the fixed points. The algorithm which computes a fixed point is due to Merrill called restart method and due to Eves and Eaves and Saigal is known as continuous deformation method.

1.1 Introduction :

This paper is concerned with the problem of finding the optimal solution of certain linear form of problems. The optimal solution of such problem already has been determined by applying the classical optimization theory for constrained functions. The procedure adopted by such method is very complex and tedious but the method of fixed point algorithm based on the technique of triangulation and vector or integer labeling developed by Todd [7,8], Merrill [3], Eaves & Saigal [1] as a refinement of Scarf [4] work is much more efficient and quick to determined the fixed points. The algorithm which compute a fixed point is due to Merrill [3] called restart method and due to Eaves & Saigal [1] is known as continuous deformation method. Both these algorithms start with a map f° and a fixed point x_o deform f^t as t $\rightarrow$ □ □to

Infact the labeling is of indexing function to mark the different vertices or point of continuous function and the Brower's fixed point theorem and Kakutni fixed distinctly marked. Under such condition any function willhave fixed point if the path of sequences x^t converges to the point completely labeled simplices. Such triangulation and labeling method has been used to prove the fixed point theorem have been proved through these technique.

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Practically the optimal solution of the linear and non linear problem, the If $x^t \rightarrow x^{\square}$ as sequence of t tending to $\square$ then $x^{\square}$ is a fixed point of f.
equilibrium points can be considered as the fixed point of some linear used to define the linear or type of problem. Since these processes give the approximate value of fixed point depending upon the process of triangulation used. Therefore different form of triangulation have been developed by Todd [9] and his co-workers to obtain the better approximation of the fixed points In brief, if S be an n- simplex, S* be the collection of subset S, and f : $S \rightarrow S^*$ be a point to set map. Then roughly the algorithm for computing in limiting sense fixed point $x \square f(x)$ for the system of f : $S \rightarrow S^*$ is to select a grid size $\square \square > 0$ and a continuous piecewise affine approximation$f\square$: $S \rightarrow S$ of f. Where pieces have diameter less than $\square$, then by using certain condition $x_{\square}$ can be shown to tend to fixed points f as $\square \rightarrow 0$.
Since these simplices obtained through various process of triangulation are the convex hull of the convex subsets of n-dimensional Euclidian space R^n. Therefore, by taking distinct co-ordinates of the vertices of a simplex and the property of the convex sets the optimality conditions for linear and non-linear problems can be obtained based on fixed points algorithms. Such technique very much simplifies the various other methods used to compute the optimality condition. The method used in this paper is based on the work of Saigal[6] subject to the following assumption considered by him : (i)
The sequence x^k converges to $x^{\square}$

(ii) f is twice continuously differentiable.
(iii) The matrix $D(f-I)(x^{\square})$ is nonsingular. (Here Dh is the Jacobian matrix of the mapping h and I is the identity map).
(iv) The Hessian matrix H_j of f_j , j = 1, . . . ,n. has the property that $|u^T H_j(x)u| \leq a\ ||u||^2$ for all u and x.

1.1 NOTATIONS AND DEFINITIONS :

1.2

As usual R^n denotes the n-dimentional Euclidian space
and the unit vector in R^n and R^{n+1} is denoted by
a set $(e^1 , . . ., e^n\}$ and $\{f^\circ, . . . , f^n\}$.

1.2.1 Simplex in R^n :

The standard n-dimentional closed simplex S^n is the convex hull of f° through f^n. A K - dimentional simplex (or K simplex) □ is the relative interior of the convex hull of (K+1) affinely independent points v^1, ... ,v^{k+1} called its vertices. We denote simplex □ = (v^1 , . . . ,v^{k+1}). A simplex □is a face of □ iff its vertices are a subset of vertices of □ and closuer of (K+1) dimentional face of K-simplex □ is called facet of □. Two simlices are said to be adjacent if they have common facet.

1.2.2 Convex set in R^n :

As usual the convex set in R^n is set consists of x_1,. . ., x_n. Such that any y □ R^n can be inforced as the linear combination given by

$$y = \sum_{i=1}^{m} \square_i x_i$$

Where $\square_i$, i = 1, . . ., m subject to non negative values such that

$$\sum_{i=1}^{m} \square_i = 1$$

1.2.3 Extreme Point :

As extreme point of a convex space is a point which can not expressed as the convex combination of any two distinct point in the convex space. The extreme points in the linear programming problems which maximizes and minimizes objective functions are called the optimal point

1.2.4 Linear Programming Problem (L.P.P.) :

The L.P.P. is given by

$$Z = c_1 x_1 + c_2 x_2 + . . . + c_n x_n \quad (1.1)$$

Subject to the constraints equation

$$\left.\begin{array}{l} a_{11}x_1 + a_{12}x_2 + . . . + a_{1n}x_n \leq k_1 \\ a_{21}x_1 + a_{22}x_2 + . . . + a_{2n}x_n \leq k_2 \\ . \quad . \quad . \quad . \\ . \quad . \quad . \quad . \\ . \quad . \quad . \quad . \\ a_{m1}x_1 + a_{m2}x_2 + . . . + a_{mn}x_n \leq k_m \\ x_i \geq 0 \quad i = 1, 2, . . . ,n \end{array}\right\} \quad (1.2)$$

Where z is called the objective function and such L.P.P. can be expressed in matrix notation as

$z = c^T x$ . . . (1.3)

S.t. $Ax \leq k$ . . . (1.4)

$x \geq 0$ . . . (1.5)

Where notation S.t. means "Subject to Constraints".
The condition of maxima and minima in the optimization problem can be determined by applying Kuhn-Tucker condition.
The optimization solution determined by the technique of classical approach can be evaluated by using fixed point algorithms. To apply the fixed point algorithm we will consider the approach considered by Saigal [6].

1.3. PRELIMINARIES

1.3.1 Vector Labeling :

Let f be the mapping from R^n to R^n then by a vector labeling we means the function
$l(x) = f(x) - x$
On the vertices x in K°. The simplexes in which all the vertices have distinct labeling is called completely. labeled simplex, such simplexes are
□= (v^1 , v^2, . . . v^{n+1}) in K such that □ □convex hull {$l(v^1)$,$l(v^2)$, . . , l v^{n+1})}
that is the following system of equation

$$\square \square \square \square \square \square \square_i \square\square \square\ l(v^i) = 0 \quad . \ . \ . \ (1.6)$$

$$\square \square \square \square \square \square \square \square_i = \square 1 \quad . \ . \ . \ (1.7)$$

$\square_i \geq 0 \quad i = 1, \ . \ . \ ., n + 1$

has a solution
if □ is such a completely labeled simplex

$x^* = \sum_{i=1} \lambda_i v^i$ . . . (1.8)

and x* is said to be an approximate fixed point of f. The following theorem due to Saigal [6] prove the justification for x* to be an approximate fixed point of f.

Based on the condition given in (1.3) we have tried to evaluate the optimal solution through fixed point algorithm. The solution of these equation have been already determined through mathematical programming method discussed in (1.2).

1.3 MAIN RESULT :

1.4.1 Let us consider the following :

$C(x) = c_1 x_1^2 + c_2 x_2$ . . . (1.9)

Subject to the condition that

$x_1 + x_2 = 20$ . . . (1.10)

$x_1 , x_2 \geq 0$ . . . (1.11)

To apply the fixed point algorithm we will consider the set of three integral values in R^2. These three set of values in R^2 divides into set of triangles, these set of triangles are similar to K_2 (m) triangulation where m is integer but large size.

On applying the condition (1.6), (1.7) and (1.8) we have obtained the set of values in table. Which has been given the tabular form (1.23). The calculation work for one set of values has been shown below for any arbitrary set of integral.

Let us consider set values (7 , 13), (9, 11),(2, 2) $\in R^2$ from (1.7) and (1.8) we have

$7\lambda_1 + 9\lambda_2 + 2\lambda_3 = 0$ . . . (1.12)

$13\lambda_1 + 11\lambda_2 + 2\lambda_3 = 0$ . . . (1.13)

Where

$\lambda_1 + \lambda_2 + \lambda_3 = 1$ . . . (1.14)

On solving we have

$$\frac{\lambda_1}{D_1} = \frac{\lambda_2}{D_2} = \frac{\lambda_3}{D_3} \quad \ldots (1.15)$$

Where,

$D = D_1 + D_2 + D_3$ . . . (1.16)

and $k = 1/D$ . . . (1.17)

□ □ □ □ □ □ □ □ □ □$_1$□ □ □ □ □ □ □ □and□$_3$ =. . . . (1.18)

For the mi $\frac{4}{3}$ m of (1.9) $\frac{40}{32}$

On selecti 2 sitive values c. □$_1$ 3

We take

$c_1 = □_1$ and $c_2 = □_3$ . . . (1.19)

and $x_1^* = \frac{c_2}{2c_1}$

$= 5$ . . . (1.20)

and $x_2^* = 20 - x_1^*$

$= 15$ . . . (1.21)

These values of x_1^* and x_2^* give

$c(x) = 21.875$ . . . (1.22)

Among the set values shown in the table those set of values which gives the higher values of c(x) for $x_1^* = 5$ and $x_2^* = 15$ are those set of values whose f(x) – x give the repeated values and graphically it has been seen that such triangles overlap the other triangles but those set of values which are distinct values of f(x) – x have non over lapping triangles. Moreover the set of values of x_1^* and x_2^* other than 5 and 15 gives the value c(x) higher than the values of c(x).

When $x_1^* = 5$ and $x_2^* = 15$. This can be clearly seen in Table 1 and graphs. (1.24 A, 1.24 B and 1.24 C)

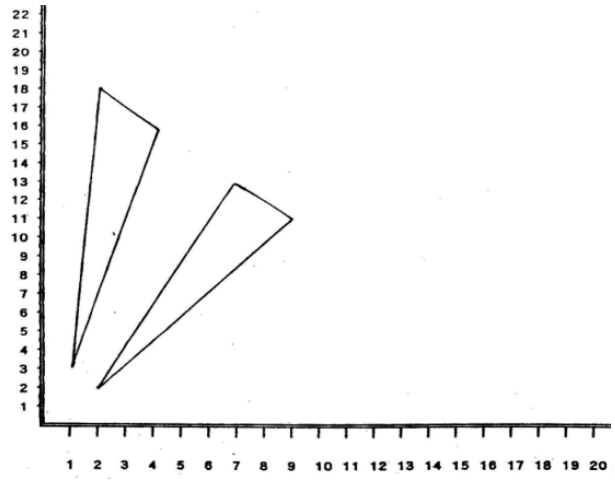
This problem has also been tried on compute and the data shown in the table as well as the graph has been obtained through computers. From the investigation we conclude that

$x_1^* = 5$ and $x_2^* = 15$ is the optimal solution of the objective function (1.20)

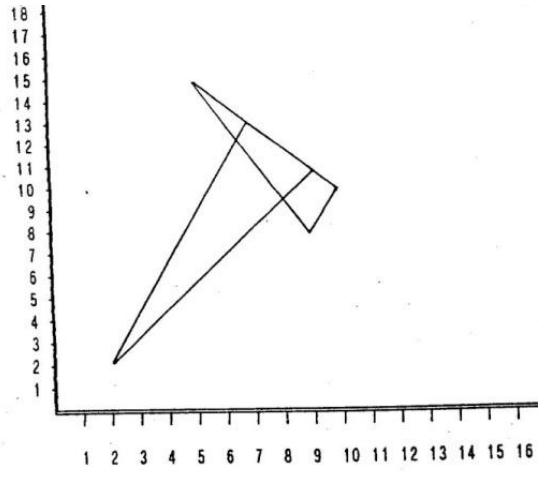
Table Showing the data obtained from Computer

Sl. No	Tringulation	D_1	D_2	D_3	$D (D_1 + D_2 + D_3)$	$k = \frac{1}{D}$	$C_1 D_2 * k$	$C_2 D_1 * k$	X_1^*	X_2^*	C(x)	C(x) - x
1.	(7,13),(9,11) (2,2)	-40	-4	+12	-32	-0.031	0.125	1.250	5	15	21.875	(-0.870,3.250) (1.125,2.750) (1.590,0.500)
2	(5,15),(10.10) ,(9,8)	-100	-10	95	-15	-0.067	0.667	6.667	5	15	116.667	(11.600,85) (56.600,56.600) (45,45.300)
3	(2,18),(4,16), (1,3)	-40	-4	12	-32	-0.031	0.125	1.250	5	15	21.875	(-1.500,4.500) (-2,4) (0.875,0.750)
4	(6,14),(9,11), (3,3)	-60	-6	24	-42	-0.023	0.142	1.429	5	15	24.999	(-0.850,6)(2.570,4.700) (-1.714,1.280)
5	(3,17),(11,9), (9,6)	-160	-15	135	-40	-0.025	0.375	4	5.3	14.7	69.330	(0.375,31)(34.375,27) (21.375,30)

COMPLETELY LABELED SIMPLICES **INCOMPLETELY LABELED SIMPLICES**

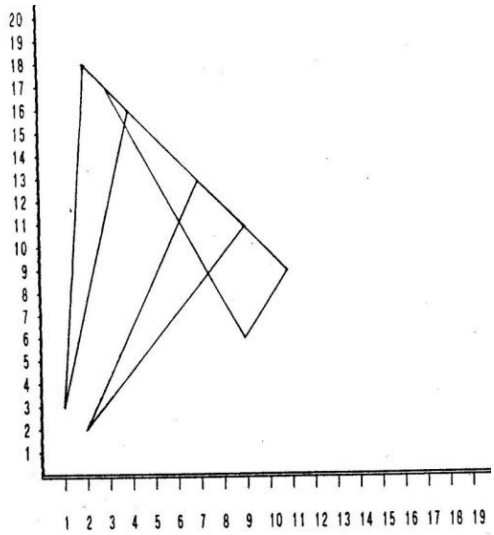


(1.24 A)



(1.24 B)

INCOMPLETELYLABELED OVERLAPPING SIMPLICES



(1.24 C)

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Application of Coding Theory for Investigating Inter-relation in Biological Data

Deveshree Chawda

Abstract

Bioinformatics is a very rapidly emerging field of study and is the application of computer science and engineering techniques in the field of biological data analysis. It makes use of computer to better understand the basic biological data (e.g. DNA bases). It helps in the study of biological patterns, structures and functions. It is also useful to solve the biological problems using DNA. A large amount of mathematics and theory of computer algorithm is involved to make Bioinformatics function in the desired and appropriate way to arrive at the expected results. Till today graph-theory approach is in vogue to find out the inter-relation or similarity measure among the biological patterns. This paper takes up a different approach of bit representation to solve such problems that involve the concepts related to Coding Theory. This method has proved a more efficient method in most of the cases and also proves to be useful in the ongoing research of machine learning and artificial intelligence for fast learning when the learning dataset is represented as bit strings.

Key words: Bioinformatics, bit-representation, coding theory, Machine Learning, Shortest Path Algorithm, Complexity, Hamming Distance.

Introduction

The evolutionary relationship between genomic data was previously represented by phylogenetic trees and other graphical methods (3D space graph representation, cubic Bezier spline curve, ClustalW (alignment-based) graphic method through Mapviewer in Physical map viewing, sorting, and comparing by Hamori Curve Genome space graphical representation for DNA sequences Method) to measure the mutual distances between the biological data like DNA and protein sequences. One instinctive way to measure these distances is to see the number of places where they are different. To find interrelation and similarity typical theoretical approach is used to measure the graph patterns. However, this could not be the best wayforever. A new concept of merging mathematics and computer algorithm with biological applications revolutionized the whole model, and it has become easier to find out an absolute result in a desired way.

In this paper, we propose and study a unique approach of bit representation of biological data. Our focus is to find out efficient ways to find the similarity measures between two biological data which the machine learning and artificial intelligence systems can leverage on. In general, distance between two sequences is measured algorithmically in terms of some geometric relationships like in error correction coding (Imrich and Klavzar 209). At elementary level, the

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problem of distance is associated with the problem of information in physical and biological systems. One of the most important contributions to coding theory has been from Richard Hamming, who came up with single-error-correcting Hamming binary codes and their single-error-correcting double-error-detecting counterparts (Hall 49).In this paper, we propose and study a unique approach of bit representation of biological data. Our focus is to find out efficient ways to find the similarity measures between two biological data which the machine learning and artificial intelligence systems can leverage on. In general, distance between two sequences is measured algorithmically in terms of some geometric relationships like in error correction coding (Imrich and Klavzar 209). At elementary level, the problem of distance is associated with the problem of information in physical and biological systems. One of the most important contributions to coding theory has been from Richard Hamming, who came up with single-error-correcting Hamming binary codes and their single-error-correcting double-error-detecting counterparts (Hall 49). \

Objective

In this paper, we propose to apply Hamming Distance Algorithm to find the interrelation between biological data with low time complexity. Also to reduce the data redundancy and execute exact information applying coding theory concepts

Materials and Methodology

Many algorithms are present to measure distance between two random sequences. Now we will analyse the application of different ideas to binary sequences and intrinsic information within a sequence. In mathematical expressions, Hamming codes are defined as a class of binary linear codes.

For $r \geq 2$, $n=2^r-1$, $k=2^r-r-1$ (r = integer, n = block length, k = message length)

$\therefore R=k/n=1-r/(2^r-1)$, (where R is rate of Hamming codes)

In the parity-check matrix of Hamming code, any two columns are linearly independent pairwise. There is a [7,4] Hamming which can detect and correct single-bit errors. A [7,4] matrix denoted by L3 is shown below:

$L_3 =$

$$\begin{bmatrix} 0\,0\,0\,1\,1\,1\,1 \\ 0\,1\,1\,0\,0\,1\,1 \end{bmatrix}$$

Above Matrix is a representation of linear error-correcting code that depicts encoding of 4 bits of data in 7 bits with addition of 3 parity bits, which means hamming code has least distance of 3.

It has among its columns each nonzero triple from F_2^3 exactly once. The [7, 4] Hamming codehas minimum distance 3(Hall 49). This suggests a general method for building binary Hamming codes.

Comparison among sequences based on its distance measure is the most basic activity and approach used in bioinformatics. The measure of distance between sequences permits us to gather similarities in their biological functionalities. In this article, we use the basic algorithm Hamming distance, to compare the distance measures between two string sequences represented as bit string. Richard Hamming firstly introduced this algorithm in his research work "*Error detecting and error correcting codes".* Hamming distance counts the number of flip bits in any binary word which is of fixed-length, for the calculation of error. Hamming analysis of bits is useful in different fields like information theory, coding theory and cryptography. Hamming distance is calculated by the difference of characters between two strings s_1 and s_2 at same position e.g.

s_1 = ATGGCAATGGGTGGCTT
s_2 = ATGGGACTATGGCATTT

Here Hamming distance d_H (s_1, s_2) = 8, The hamming distance is calculated by counting the number of charactor differences between two strings (s1 & s2).It means to lower the dissimilarity of these two sequences 8 substitutions will be required.

Coding theory is one of the most reliable and useful applications in information theory.In the coding concept a geometric description of data is represented in bit form, which is the main source of information.Here, through Data compression (source coding) and Error-correcting codes (channel coding), information is extracted after reducing the redundancy at its best level. In this paper, we propose to apply Hamming Distance Algorithm to reduce the data redundancy and execute exact information applying coding theory concepts (Hogman, French and Westhead 69).

Analysis

Going into further detail the algorithms also performs well in complexity analysis. Many experts are comfortable using algorithms as BLAST that is like a conscientious robot where a sophisticated algorithm program works in the background, but the user does not know how it will work. It can solve a particular problem to an extent, but not with certainty. That's why here complexity is high. The relation between strings using coding theory can be found out with the help of machine learning where a machine is fed with actions, and it produces the results according to its sensory mechanisms and correlation between its knowledge and object in front of it. With the help of graph method of shortest path algorithm like FLOYD, interrelation between two strings can be found. If n are vertices, then to calculate n^2 of shortest Path, 2 n^2 operations will be required. Thus total operations used are

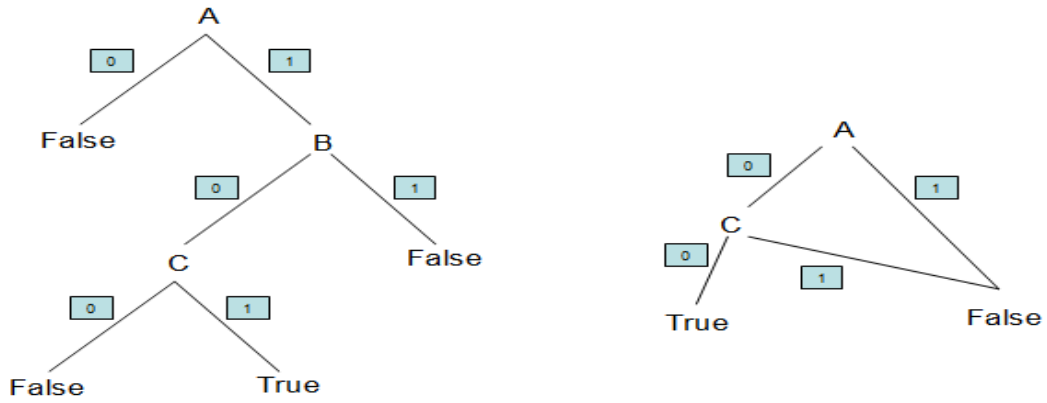
$$n \cdot 2n^2 = 2\, n^3 \quad \ldots(i)$$

$$\theta = n^3 \quad \ldots(ii)$$

$n = \log_2 n$ …(iii)

Here complexity θ of algorithm will be n^3 for shortest path (Eq .ii). In a graph *n* nodes are portrayed as *n* forms. If we take two nodes as states and code them in binary form, minimum bit difference between nodes shows they are more interrelated. So, if there are *n* states they can be represented in $\log_2 n$ bits(Eq .iii).

Computing Minimum Hamming Distance: state representation



Single State *n* [101] set *m* [000, 010]

Fig. 1: Algorithm of Binary Hamming Graph (Demonstration of the Hamming distance algorithm)

Figure1 shows a state representation of Computing Minimum Hamming Distance it is a graphical representation of the Algorithm of Binary Hamming Graph. It is more of a flow diagram than a tree.In this n is a Single state and m is a set

Where *n*= [101], & Set *m* = [000], [010].

If A=1, $d_H = \infty$ (bit value for A is same for *n* and *m)*

If A=0, $d_H = 1$ (bit value for A will be different).

If *m* removes the unnecessary node B, the algorithm will continue to the next variable C.

If C=1, then $d_H = \infty$

If C=0, $d_H = 1.$, (bit value will be different for both n, m)

Inveterate it to the parent node A, the minimum distance on d_H becomes distance at node C + node A.

Therefore, $d_H = 2$.

Hamming distance is helpful even in simple estimations. For any given binary graph algorithm, hamming distance shows time complexity θ of m^2 ..(Eq. iv) If there are *n* bit strings then complexity θ between any two strings will become $m^2 * n$ (Eq. v).

$\theta = m^{2.}$ ..(iv)

$$\theta (s_1.s_2) = m^2 * n. \qquad ..(v)$$

Hamming Graphs are those which can be inserted isometrically in a Cartesian product of the entire graph. In direct execution we must check for all pairs of edges whether they are in relation or not (Imrich and Klavzar 209). For a graph algorithm, time complexity is (m^2). Describing below is an algorithm of Binary Hamming graph:

Input: a connected graph G.

Output: TRUE, and a labelling, if G is a binary Hamming graph. FALSE, otherwise.

1. If G is not bipartite then return FALSE and stop.
2. Compute θ1.
3. Compute G_i, i = 1, 2,……..k and α(v), v ∈ V (G).
4. For i = 1,2,……..k, compute m_i, i.e., the number of components in Gi. If for any i, m_i> 2, then return FALSE and stop.
5. Return TRUE and the labelling of G obtained in step 3

Result

Algorithm Binary Hamming Graph (BHG) correctly distinguish binary Hamming graphs and is successfully executed to run in θ (mn) time using θ (m) space and can be applied to run in θ (n^2 log n) time using θ (n log n) space (Imrich and Klavzar 209).

Here the question comes that if n is the length of a bit string, for n states it will give a complexity θ of only $\log_2 n$. *So,* the total complexity becomes

$$m^2 * \log_2 n$$

$$\boldsymbol{m^2 * \log_2 n < n^3}$$

(m<n).

$m^2 * \log_2 n$ is smaller than n^3, complexity shown by a shortest path algorithm (FLOYD), where $m$is smaller than n.

Thus, we can calculate the interrelation between strings easily because complexity is low. Based on these calculations the application of hamming distance on coding theory demonstrated more accurate results.

Conclusion

Trustworthy information exchange and execution is a critical necessity in both biological and artificial systems. Through artificial intelligence, information processing systems like coding techniques assure the required reliability of data. It enables the interrogation of biological patterns and functions using DNA. This method can work in an efficient way and useful in ongoing research of artificial intelligence and machine learning.

Hamming distance is one of the most practical and easy-to-define metric; it is successfully used to discover the state space for designing flaws. Hamming distance algorithm as estimation demonstrated that there could be a considerable drop in complexity and exact

information can be extracted from biological data. This hypothesis of information theory advocates a complete renewal of genetics, which is indeed an extensive and challenging task.

It is a vast area of research that opens new doors to genetics and evolution theories. Collaboration between mathematicians and biologists will be highly beneficial for both communities. Future work will be focussed on the improvement of search performances and enhancement of quality of solutions and speed of convergence using coding theory.

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PLANT MITE: AN ARTICLE.

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Abstract

Spider mites are members of the Acari, living on the undersides of leaves of plants, spinning protective silk webs, cause damage to the plant cells. The accelerated reproductive rate allows spider mite populations to quick resistance to pesticides. They are cosmopolitan distributed, and attacks a wide range of plants, including peppers, tomatoes, potatoes, beans, corn, cannabis, and strawberries, other commercial plants include fruit tree and citrus. Countermeasures may provide control, when combined with a suitable surfactant and diluted with water but repeated applications are required with chemical control. Predatory mites eat adult mites, their eggs, and all developmental stages between. Spider mites are wind surfers. They disperse over wide areas riding their webbing on the breezes. Careful containment and disposal of infested plants is crucial.

Keywords: Spider mites, damage, plants, Countermeasures, Predatory mites, crucial.

Introduction

The plant mites are the spider mites, member of the Acari, group *Tetranychus urticae*, *family*Tetranychidae, which includes about 1,200 species. The family is divided into subfamilies, tribes and genera in "Key to the genera of the world" given by H. R. Bolland, *et al.* (1997), having cosmopolitan distribution studied by D. A. Raworth, *et al.* (2002); and attacks a wide range of plants, including peppers, tomatoes, potatoes, beans, corn, cannabis, and strawberries (figure 1). Thomas R. Fasulo & H. A. Denmark (2009) shown that other species which can be important pests of commercial plants include *Panonychus ulmi* (fruit tree red spider mite) and *Panonychus citri*(citrus red mite). They generally live on the undersides of leaves of plants, where they may spin protective silk webs to protect the colony from predators, and called "Spider" (Figure 2) and they can cause damage by puncturing the plant cells to feed given by Yutaka Saito (2009), also reported that Spider mites are known to feed on several hundred species of plants (Figure 3).

Anatomy and life-history

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With naked eye, plant mites look like tiny, moving dots, easily visible with a 10X hand lens. They are 0.04 inches in size and vary in color. The Adult mites have eight legs and an oval body with two red eyespots near the head end. Adult females are the largest forms less than 1/20 inch long; noticed by their movement; tiny, soft-bodied, and a little creepy; they have their 2 front legs directly extending farther out than their other legs; having a large, dark translucent blotch on each side of the body and numerous bristles covering the legs and body. Thomas R. *et al.* (2009). Large amount of webbing cover leaves , twigs and fruits. Most species of web spinning mites produce silk. Webbing on infeasted under sides of the leaves (fig. 4)Spider mites live in colonies, mostly on the undersurfaces of leaves; a single colony contains hundreds of individuals. Immature nymphs resemble adults except they are much smaller, and the newly hatched larvae have only six legs. The other immature stages have eight legs (Figure 5). Spider mites are very adaptable. They can be brought into garden by bringing in other outside plants. They can also be transmitted from ones clothes, pets, as well as other indoor plants.

Under optimal conditions approximately 80 °F or 27 °C, the two-spotted spider mite can hatch spherical, translucent droplet like, becoming cream colored before hatching (Figure 6). Spider mites lay hundreds of small, spherical, initially transparent 20 eggs per day in less than 4 days and can live for 2 to 4 weeks. Spider mitepopulations adapt quickly to resist pesticides due to this accelerated reproductive rate studied by Yutaka Saito (2009). Graham Bell (1982) worked on parthenogenesis and vegetative reproduction in multicellular animals and reported Spider mites, like hymenopterans and some scale insects, are arrhenotochous: females are diploid and males are haploid, when mated, females avoid the fecundation of some eggs to produce males. Fertilized eggs produce diploid females. Unmated, unfertilized females still lay eggs that originate exclusively haploid males.

Damages

High populations—levels of Plant Mites causes damage by sucking cell contents from leaves, shows up as a stippling of light dots on the leaves; sometimes the leaves turn to bronze color. As feeding continues, the leaves turn yellowish or reddish and drop off (figure 7). Damage is usually worse by water stress. Loss of leaves won't cause losses in fruit yielding trees when occurred in spring or early summer, but it may impact next year's crop also. On annual vegetable crops—such as squash, melons, and watermelons—loss of leaves can have a significant impact on yield and lead to sun burning. Spider mites can cause direct damage to crops such as sugar peas and beans, where pods are attacked. Spider mites are also important pests of ornamentals and field-grown roses.

Countermeasures-

The first step is to identify the problem and then getting rid of a spider mite infestation. Following are some:

Neem oil: may provide control, when combined with a suitable surfactant and diluted with water. As with chemical control, repeated applications are required.

Cultural Control: Cultural practices can have a significant impact on spider mites. Dusty conditions lead to mite outbreaks. Apply water to pathways and other dusty areas at regular intervals. In gardens and on small fruit trees, regular, forceful spraying of plants especially on the undersides of leaves with water will reduce spider mite numbers adequately. Use of an insecticidal soap or oil can be spray, but test the product on one or two plants to be sure it isn't damaging to them.

Chemical Control: Dreistadt, S. H., *et al.* (2004) has explained the other ingredients that may more effective such as capsaicin, alcohol, cinnamon oil, lemon juice, garlic extract, soap, etc. acts as an irritant to the mites. **But** these methods are preventative for small-scale purposes.

Freezing Spider Mites with Co_2:

The extreme tactic is Co_2fumigation. Plants live off of Co_2, while spider mites are aerobic and need oxygen. Plants are kept in a sealed environment and Co_2 fumigation will kill the mites with certainty. But a properly controlled Co_2 fumigation is very effective, as it is very difficult to set it up as it requires a closed space and also need to regulate the Co_2 content and ventilate the area properly. Nevertheless Fumigation requires expertise and equipment, and a great deal of caution as may be dangerous to humans and to other animals given by Flint, M. L. (1998).

LAVAMITE:

If an established spider mite infestation occurs, then a straightforward, affordable method to wipe it out is through a non-toxic spray such as Lavamite which is a non-toxic, ready to use formula that combines chemicals to produce a hellish environment for spider mites completely destroying, providing no oxygen, delivering an alkaline based suffocation which burns them instantly, all without hurting, spraying, picking, pinching etc. to the plant at all, this was studied and proved by Godfrey L. D. & Davis UC ANR Publication 7405.

Monitoring and Management:

Mites are tiny and difficult to detect. Usually plant damage such as stippled or yellow leaves can be notice before spotting the mites themselves. Check the undersides of leaves for mites, their eggs, and webbing with the help of hand lens. To observe mites more closely, shake a few off the leaf surface onto a white sheet of paper. Once disturbed, they will move around rapidly. Be sure mites are present before you treat. Sometimes the mites will be gone by the time you notice the damage; plants will often recover after mites have left.

Adequate irrigation is important, because water-stressed plants are most likely to be damaged. Broad-spectrum insecticide treatments for other pests frequently cause mite outbreaks, so avoid these pesticides when possible.

Biological Control: predatory mites and insects:

Various important insect predators includes— Scolothrips sexmaculatus (six spotted thrips) (Figure 8), Stethorus picipes (lady beetle) destroying the larvae and adults of the spider mite; the larvae of certain flies including the *cecidomyidFeltiella acarivora* (figure 8 and Figure 10). Spider mites have many natural enemies, which limit their numbers in many landscapes and gardens, especially when undisturbed by pesticide sprays. Some of the most important are the predatory mites and predator insects, including the western predatory mite (Figure 9), *Galendromus occidentalis,* and *Phytoseiulus* mite species. Predatory mites are about the same size as plant-feeding mites but have longer legs and are more active; they also are more teardrop-shaped than spider mites. Predatory mites eat adult mites, their eggs, and all developmental stages between. Predatory mites can consume as many as 5 adult spider mites per day, or 20 eggs per day.

various general predators such as minute pirate bugs, big eyed bugs, and lacewing larvae. Western flower thrips, *Frankliniella occidentalis*, can be an important predator on spider mite eggs and larvae. The predators to spider mites naturally find where spider mites are hiding to consume them. Chemical handling can be somewhat expensive, and the predators need a welcoming environment to get really established. But there is no guarantees that the predators will surly go after certain species of mites, or not eat the eggs of certain species. And it also takes time for them to grow with the spider mite population.

Sprays of water, insecticidal oils, soaps or insects fogger (fig.11)can be used for management. Always monitor mite levels before treatment.

SNS 217: Safe to use on delicate new growth, clones, tomatoes, roses and many other plants even trees, but NOT on flowers as it may burn. This is available as a ready-to-use spray or money-saving concentrate. (Figure11)

Drowning:

Drowning the mite is another method. Fully soak the plants within water, wrapping up their roots, in order to flood the mite population. While this does work, it is a bit labor intensive. Furthermore, it only works for smaller potted plants not on larger crops and plants.

In some cases, the application of Harpin Alpha Beta protein may help in the treatment and prevention of infestation by stimulating the plant's natural defenses, restoring sap sugar levels and encouraging replacement of damaged tissues found from (website :1 http://www.owlyn.com/; website :1 website :2 html;http://www.halo-harpin.com). Since spider mites down-regulate the immune response of a plant, there is evidence that the application of Harpin may speed recovery and help prevent secondary infection and infestation, (website :3

https://library.villanova.edu/Find/Summon/Record)&(website :4 http://www.researchgate.net/publication/229118471)

Figure 1. Spider mites.

Figure 2. Spider mites on a lemon plant.

Figure 3. Mite colony on underside leaf.

Figure 4. Web spinning mites can produce copious amounts of webbing.

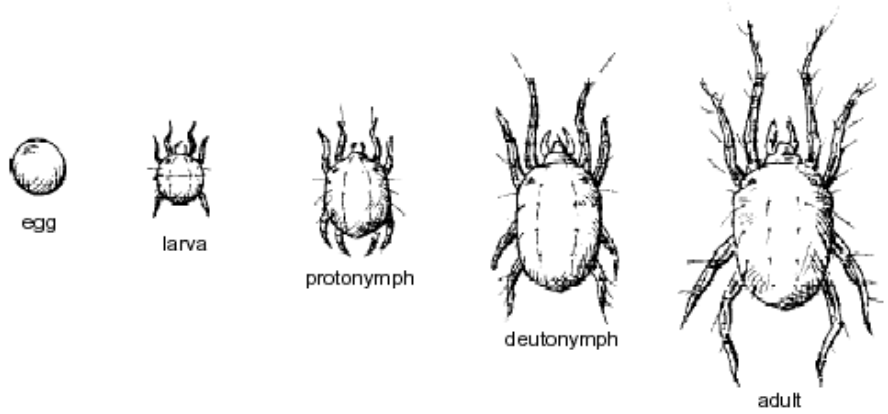

Figure 5. Spider mite life cycle, development of a typical plant-feeding spider mite—egg,

larva, two nymphal stages, and adult.

Figure 6. Twospotted spider mite eggs.

Figure 7. These once healthy plant leaves have been sucked dry of life

Figure 8. Larvae of predatory midges, such as this Feltiella species, prey on spider mites.

Figure 9. The western predatory mite, shown here attacking a two spotted Spider mite is an important predator.

Figure10. Biological control:

The six spotted trips feed on spider mites and their eggs.

Figure11.Insect Fogger

Figure12. **SNS 217**

Conclusion:

Chemical pesticide used encourages the spider mites spreading by killing the beneficial insects that prey on them. Mites are quick resistant to various pesticides. For these reasons, it's important to control mites with effective, natural, organic methods. Prune leaves, stems, and other infested parts of plants well past any webbing and discard them in trash. Insecticidal soap, neem oil, or botanical insecticides can be used to spot treatment for heavily infested areas. On fruit trees, horticultural oil should be applied early in the season or late in the fall to destroy over wintering eggs, but if eggs and larvae survive targeting the adults will do little good. Repeat treatments are almost always necessary. And if populations are high, use a least-toxic, short-lived pesticide to reduce infestations, and then release predatory mites to maintain control. Whichever method is chosen to get rid of spider mites, it's important to keep in mind that there are also cautionary tactics to make sure that the spider mites are destroyed properly.

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Ichthyodiversity of Two Ponds of Rajnandgaon District,CG, India.

Usha Thakur

Abstract

The present work has undertaken for the identification and the diversity of fishes in the fresh water ponds of Rajnandgaon area of Chhattisgarh. Fishes were collected from two ponds; one pond is Budhasagar and another pond is Ranisagar . The present paper deals with the variety and abundance of fresh water fishes in Ranisagar and Budhasagar ponds of Rajnandgaon district (C.G.) India. The investigation reveals that all the fishes showed presence of the diversified mixed population of fishes in both of the ponds.

Keywords Ichthyodiversity, *Oreochromis aureus, Oreochromis mossambica,Cyprinus casrpio ,Mystus cavasius, Puntius titco.*

Introduction

Fishes may be defined as the cold blooded vertebrates having adaptation for a purely aquatic life. Fishes comprise 30,000 to 40,000 species which differ widely from one another in shape, size, habit and habitats. Fish show great diversity in their form, size and behaviour and some are blessed with certain specialized features which are unique in significance , as mentioned afterwards. India is one of the mega biodiversity countries in the world and occupies the ninth position in terms of fresh water mega biodiversity Mittermeier *et al*. 1997. In India there are 2,500 species of fishes of which 930 live fresh water and 1,570 are marine, Kar, et al.,2003. In short the extent of variations in fishes is very wide.

Biodiversity is essential for ecosystem protection of overall environmental quality of understanding intainsic worth of all species on the earth Ehrlich, *et al*., 1991. In the field ichthyology there is valuable contribution by many workers Singh.2005. Jayaram. 1981. Joshi *et al*., 2002. Mahapatra.2003. Bossuyt. 2004. Devashish. 2006. Kumar*et al.,* 2008. Rajalaksh *et al*., 2005. Rathod*et al.,* 2008. As per economic importance and scope of fish and fisheries it is natural to study the distribution and the availability of fish from fresh water reservoirs and ponds especially in Chhattisgarh.

The present investigation was undertaken to study the fish diversity from Ranisagar and Budhasagar pond is a first time effort in this direction. Various indigenous and commercial fishes of importance were found in this area. Ranisagar and Budhasagar is a big size ponds nearabout 75 acre area of Ranisagar and 53 acer area of Budhasager. Both pond is built by Rajnandgaon Raja Mahanth Digvijay Das . Now this pond is used in various ways for example fishing, bathing, and washing, fish cultivation etc. The pond is mainly rain fed.

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Materials and Methods

Live specimen collected from Budhasagar and Ranisagar ponds throughout the year with the help of local fisherman using different nets namely gillnets, dragnet, castnet etc. It is rare to capture in high temprature and summer season. It is essential to collect specimens of fishes only where they cannot be identified in the field. When collected, it is necessary that the live colour of the fish be recorded immediately photographs were taken with the help of digital camera. It was very useful to note the local names of fishes, wherever avalable. The fishes were collected alive and carried in container to the laboratory in polythene bags containing water of same locality.

Fishes brought to laboratory were fixed in 8% formalin for the preservation. Smaller specimens were directly put in formalin, while medium sized ones prior to the fixation were given a longitudinal incision along the abdomen. Large forms were fixed by injecting 10% formalin into the muscles and abdomen. The meristic and morphometric characters were measured and fishes were identified up to the spices level, with the help of standard key and books. Day. 1967. Jayaram. 1999. Talwar.*et.al.*, 1991.

Result and Discussion

In present ichthyodiversity study in18 Species of 5 order & 6 Families were recorded from the Budha sager pond. The members of order cypriniformes were dominated by 10 species, followed by perciformes 3 species and clupeiformes, 1 ophiocephaliformes 2 and siluriformes with 2 species. Order cypriniformes were found in abundant form, order siluriformes and ophiocephaliformes found in less abundant form, order perciformes found in most abundant shown in table 1 and photographs of various fishes found in Budha-sagar pond is shown in plate – I

In Rani sager pond 8 species of 3 order & 4 families were recorded. Order cypriniformes ,4 species and 1 family, found in abundant from, order siuriformes 1 family, 1 species found in less abundant. order perciformes 1 family 3species found in most abundant shown in table no. 2. and photographs of various fishes found in Ranisagar pond is shown in plate no. I.

Table - I - Ichthyodiversity Of Budha-Sagar Pond

Order	Family	Scientific Name	Common Name	Group Of Food Fish	Status
Clupeiformes	Notopteridae	*Notopterus notopterus*	Patra	Airbladder	+
Cypriniformes	Cyprinidae	*Catlacatla*	Catla	Fish	++
		Lbeo kalbasu	Black rohu	carp	++
		Labeo rohita	Rohu	carp	++
		Cirrinus mrigala	Mrigala	Carps	+ +
		cyprinus carpio	Common carp	Carps	+
		Mystuscavasius	Tegna	Carps	+

		Mystusvittatus	Tegna	Food fish	+
		Mystus gulio	tegna	Food fish	+
		puntius titco	Titco	Food fish	+
		Puntius sophore	Titco	Miscelane-ous fish	+
Ophiocephali-formes	Ophiocephalidae	*channa gachua*	Bijalwa		+
		Channa punctatus	Khoksi	Live fish	
perciformes	Anabantidae	*Anabus testudineus*	Kawai	Food fish	+
		Oreochromis mossambica	Tilapia (Red) Tilapia(Black/Blue)	Food Fish	+++
		Oreochromis aureus		Food fish	+++
Siluriformes	Cichlidae	*Clarias batrachus*	Magur/cat fish singhi	live fish	++
	Heterophenustidae	*Heterophenustes fossilis*		Live fish	++

+++ most abudant , ++ Abundant , + less abundant.

Table - II Ichthyodiversity of Rani-Sagar Pond

Order	Family	Scientific Name	Common Name	Group Of Food Fish	Status
Cypriniformes	Cyprinidae	*Catla catla*	Catla	Carps	++
		Labeo rohita	Rohu	Carps	++
		Cirrinus mrigala	Mrigala	Carps	++
		cyprinus carpio	Common carp	Carps	++
Siluriformes	Ciaridae	*clarias batrachus*	Magur/Cat fish	Live Fish Live Fish	+
	Heteropneustidae	*heteropneustes fossilis*	Singhi		+
Perciformes	Chichlidae	*Oreochromis mossambicus*	Tilapia(Red)	Food Fish	+++
		oreochromis aureus	Tilapia(Blue or Black)	Food Fish	+++

+++ Most abundant , ++ Abundant , + Less abundant.

IDENTIFIED FIS

Notopterus notopt

Labeo rohita

Oreochrmis mossambica

Mystus cavasius

Puntius sophore

Channa gachua

Clarias batrachus

Heteropheustes fossilis

Catla catla

Cirrinus mrigala

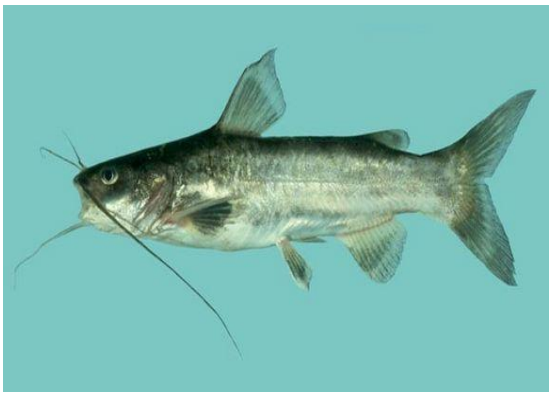
Anabus testudineus

Puntius titco

Channa Punctatus

Myutaus Vittatus

Labeo Kalbasau



Mystus Gulio

Fig: Different species of fishes reported from Budha sagar & Rani sagar Rajnandgaon

Conclusion

The use of illegal methods to catch fish should be banned in this area. The fisherman's should make aware about fishing improvement of production of fish in natural water both in quality and quantity, and improvement in the methods of fishing, fishing effort, fishing gear and craft so as to ensure better production. Itshas been observed that existing efforts need to be reduced to a great extent to achieve maximum sustainable yield and also to conserve the long term productivity of the both ponds ofRajanandgaon.

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Microbial Study of Sewage Water; A Case Study of Parri Nala & Sheonath River, Rajnandgaon City C.G.

Sanjay Thiske[1] and Pramod Kumar Mahish[2]

Abstract

Sewage and wastewater contain bacteria, fungi, parasites, and parasitic protozoan that can cause intestinal, lung, and other infections. The bacteria may cause diarrhea, fever, cramps, and sometimes vomiting, headache, weakness, or loss of appetite. For the identification of bacterial species author used a bacterial testing kit of mark. During the analysis of the municipal sewage water contain hazards bacterial species i.e. *citrobactor (coliform bacteria), salmonell , klebsella and enterobactor* , similarly the water of Parrinala contain *klibsiellaenterobactor* species and *vibrio*; *pseudomonas* and *vibiro* species of bacteria are find after the water analysis. Every pathogenic Bacteria and protozoan find in aquatic medium. In urban and rural area only and only human population responsible for earth's fresh h surface and flowing water. Thousand people of Rajnandgaon city are live beside the municipal nala in many place author find the small hotels and restaurant are found near the polluted nala. Due to this reason, different types of human health problems arises like hepatic, chronic diseases of alimentary canal and some water borne diseases during rainy and summer season.

Key Words: Municipal waste water, Sheonath River, Bacterial contamination,

Introduction:

Some bacteria and diseases carried by sewage and wastewater are *E. Coli*, shigellosis, typhoid fever, *salmonella*, and cholera. Fungi such as *Aspergillus* and other fungi often grow in compost. These can lead to allergic symptoms (such as runny nose) and sometimes can lead to lung infection or make asthma worse *Aspergillus*. Parasites including *Cryptosporidium* and *Giardia lamblia* may cause diarrhea and stomach cramps, and even nausea or a slight fever Sohani and Sanjeeda, (2012). Some major Indian Rivers are facing water pollution problem; like Ganga, Yamuna, Gomti etc. where a huge population of India is living besides polluted Rivers.

So, a separate ministry is now established by Govt. of India due to this serious problem of River pollution.A number of researchers have been conducted on the quality of sewage entering into different Rivers in India such as Hart, C. A. (2006)., Krauss, H., *etal*. (2003), Mishra Archana and Tripathi B. D., 2007, Michaud, J.P. 1991,Obiri-Danso, K., *etal*. (2009)Sohani Smruti and Iqbal Sanjeeda:(2012),Shiddamallayya N. and Pratim M. 2008, Sanders, H.O., and O.B. Cope. 1966, Swapnil M. Kamble: 2014, Tripathi B. D., 1986,Verma S. R., Tyagi A. K. and Dalela R. C.1978.

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The life line of Chhattisgarh state is Mahanadi which is now polluted with mining of mineral resources and also damaging by sand extraction. Apart from Arpa, Kharoon, and Sheonath are extremely polluted River of the country and the pollution level were found higher than the limits. Aquatic plants and animal are facing very horrible situation for their survival. All Rivers contain BOD level more than ten times by the normal. According to CPCB report the water of Mahanadi, Arpa and Sheonath is not achieve the freshness parameter. According to the report 100 ml. water contain bacteria more than 500 hundreds is too harmful for flora and fauna but the Rivers listed above contain more than 1000 bacteria in 100 ml. water. CPCB has analyzed the water of all three Rivers in different places and find the water quality of River is very horrific due to presence of *coliform* bacteria. CPCB test the pollution level in all three Rivers on the basis of the data which was available from 2005 to 2013.

The Sheonath River is life line of western Chhattisgarh and many agriculture farmers, Rajnandgaon and Durg municipality, fish farmers, and other huge population are directly and indirectly depending on it. So, the pollution in the water of this river directly affect the health, economy and social status of these inhabitants; according to the CPCB, New Delhi the rivers of the Chhattisgarh (including Sheonath river) are polluted. The pollution of Sheonath River from Municipal sewer of Rajnandgaon city was not studied in this region, previously so the present work not only reporting the pollution contents but also it will be use as a reference for coming researchers. The suggesting remarks of the present work regarding low cost water treatment planning will helpful to purified the water from Parrinala and Sheonath as well as it will also aware the citizens of Rajnandgaon.

Material and Methods

Rajnandgaon located in 21.10°N to 81.03°Eis one of oldest city of Chhattisgarh state. It is rapidly developing city of Chhattisgarh with urbanization and industrialization. These could release numerous amounts of solid waste, municipal waste water and industrial effluent. Sheonath River is the biggest tributary of Mahandadi River. It has a total course of 290 km. originates from Panabaras hill, 624 m. above from sea level in Ambagarh Chowki division of Rajnandgaon district of Chhattisgarh. The study areas are within 15 km. from laboratory. The water sample was collected from municipal release and municipality joining to the Sheonath River. The sample collection was done from May 2014 to April 2015. The water samples were collected in sterile plastic bottle washed previously with deionised water and detergent. The sampling was done morning between 06 to 08 AM and bacteriological experiments were performed within 06 hr of sampling. Microbial analysis is one important observation while studying the water pollution. The bacteria were identified using the Himedia bacterial testing kit based on H_2S production.

Result and Discussion

The municipal sewage, sewage connecting Parrinalla and affecting Sheonath river were

analysed to find out the presence of different verity of bacteria. it has been noticed that there is marked difference in bacterial occurrencein all the sources survey.

The test carried out on the collected samples showed that bacteria like Klebsiella, *Enterobactor, Citrobactor, Salmonella, Vibrio* and *Pseudomonas* were found in the polluted water. Apart from these genuses, the sewage water may also contain other bacteria.

Klebsiella and *Vibrio* were obtained from all the three sources while *Enterobactor*, *Salmonella* and *Pseudomonas* were obtained from more than one source. *Citrobactor* obtained only from municipal sewage site. Almost all the bacteria originated from different seasons of municipal waste water few of them also obtained from Parrinalla and Sheonath River which indicating the contamination of bacteria in river by municipal joining. While some genus of bacteria were found alone in municipal waste water only (Table 1).

Table 1. Seasonal Incidence of Bacteria in Municipal Sewage

S. No.	Bacteria	Municipal Sewage			Parri Nalla			Sheonath River		
		R	W	S	R	W	S	R	W	S
1	*Klebsiella*	-	+	+	+	+	+	-	+	-
2	*Enterobactor*	-	+	+	+	+	+	-	-	-
3	*Citrobactor*	+	+	-	-	-	-	-	-	-
4	*Salmonella*	+	+	+	-	-	+	-	-	-
5	*Vibrio*	-	+	-	+	+	+	+	+	+
6	*Pseudomonas*	+	-	-	-	-	-	+	+	+

R = rainy, W = winter, S = summer

Of the three season vibrio bacteria is the most common one in all the season and in all the sources. On the opposite end *citrobactor* is found only in sewage water during rainy and winter season . the following plates depict the confluence off the sources Parrinals and Sheonath .

Plate 1. Cities North Direction Of The Sewage WaterFlowing Toward Parrinal

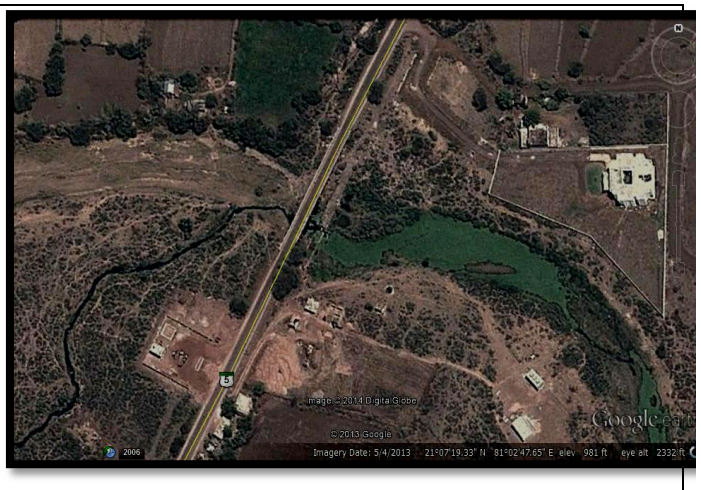

Plate 2. Municipal Sewage Drain In Parrinala North Direction of city

Plate 3 North Direction Municipal Sewage Drain In Parrinala of city

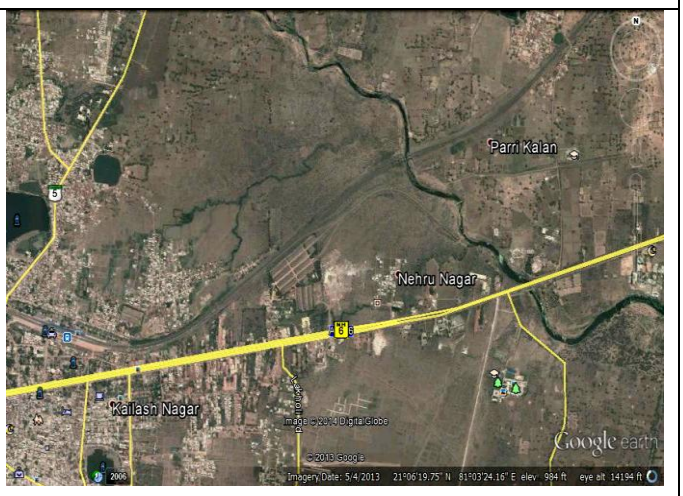

Plate no. 4 East direction of the city sewage water drain in parrinala

late no.5. East direction of the city sewage water drain in parrinala

Plate no. 6. East south direction of the city showing clear satellite view Parrinala water mix with sheonath river at Bharregaon village

Plate no. 7.All picture showing origin of Gokul Nagar fresh water Nala contain sewage and faecal material of cow and buffalo

Plate No.8.South west direction of the city :the sewage of Gokul Nagar waste drain in sheonath water

Conclusion :

It may be concluded on the basis of above analysis that more then half a dozen bacteria has developed in the sewage /polluted water in the study area. This may be the case of anywhere anytime in case of untreated sewage water that pollutes the fresh river water, too.

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Blood Booster Plants and Fishes: A Review

Preeti Mishra and Seema Gupta

Introduction

Botanicals are used as herbal remedies for the health care since the ancient times, prevention and cure of various diseases and ailments (Kalia, 2005). Their applications are found in improvement of the health of organisms and in control of infections that can be termed as medical herbalism or phytotherapy. India is now at the doorstep of "Blue Revolution" and has made a tremendous progress in the field of inland fisheries. Fishes are palatable and rich source of protein food for human beings. They are not only nutritive but have medicinal value and used as ethno-medicine. Production of healthy and disease free fishes are the main motive of profitable aquaculture. Plants and their products can inhibit the growth of microbial pathogens (Immanuel *et al*., 2004) and are safer, bio-degradable and eco-friendly (Nargis *et al*., 2011). They are easily available to the fish farmers in rural areas at low cost than modern medicine that's why they are extensively used in the countries like China, India, Japan, Mexico and Thailand (Yin *et al*., 2008).

The Chinese describes blood as "mother of energy" because it provides the basic building material and fluid substances required to nourish the life of the organism. Haematological parameters can be a useful indicator of the physiological changes in animals and are crucial in providing vital information on the general well-being of fish (Tavares-Dias and Morares, 2007). They respond quickly to the changes in environmental conditions (Fernades and Mazon, 2003) and are used for the explanation of healthy state of fish. Therefore, haematological variables serve as a sensitive index for controlling fish diseases and improving fish cultivation (Cazenave *et al*., 2005). There are several investigations on the effect of plant extracts on the hematology of the fishes.

Catla catla :

Kaleeswaran *et al.* (2012 a & b) observed the variation in the haematological parameters after feeding with *Cynodon dactylon* mixed diet for 60 days and reported significant change in blood parameters. The effect of *Coriandrum sativum* and *Plumbago rosea* on hematology was studied by Innocent *et al*. (2011a & b). They reported significant increase in the values of RBC, hemoglobin and WBC of treated fishes.

Labeo rohita*:* Sahu *et al*. (2007b) reported significant rise in WBC, RBC and haemoglobin level

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in *L. rohita* fingerlings infected with *Aeromonas hydrophila* and treated with *Magnifera indica* kernel. Tewary and Patra (2011) investigated the effect of Baker's yeast (*Saccharomyces cervisiae)* on innate response and haematological variables. They reported significantly higher RBC, Hb and PCV values.

Cirrhinus mrigala*:*

Regina (2006) studied the influence leaf extract of *Phyllanthus emblica*, (Linn) and reported alterations in the blood parameters.

Clarias batrachus:

Effect of aqueous and alcoholic extracts of leaf, stem and root of *Eclipta alba* was studied and significant increase in RBC, Hb, PCV and WBC and some changes in MCV, MCH and MCHC was reported by Mishra (2013).

Clarias gariepinus:

Dada and Ikuerowo (2009) observed the effect of *Garcinia cola* seed. Significant increase in red blood cells, haemoglobin and pack cell volume in the treated group suggested that ethanol extract of *Garcinia cola* mixed diet may be beneficial for fish health. Soosean *et al*. (2010) investigated the effect of methanol extract of leaf, shoot and rind of *Garcinia mangostana* L. on haematology of *C. gariepinus* fingerlings and reported significantly higher count of RBC and WBC in *G. mangostana* fed group. Increased values of RBC, Hb, PCV& WBC and slight change in MCV, MCH and MCHC was noticed after the exposure of aqueous and alcoholic extracts of different plant parts of *Eclipta alba* (Mishra, 2013)

Cyprinus carpio:

Effect of aqueous extract of leaf of *Azadirachta indica* on fish infected with *Aeromonas hydrophila* was studied by Harikrishnan *et al.* (2003). They observed significantly increased WBC following infection. The RBC, Hb and PCV decreased initially in infected fishes which regained normal levels at later time. Mohamad and Abasali (2010) reported enhanced RBC level, WBC counts and haemoglobin content in treated group with mixed diet containing ethanol extract of five plants (*Brassica nigra*, *Chelidoniume majus*, *Echinacea purpurea*, *Inula helenium* and *Tussilago farfara*). Alishahi *et al*. (2010) investigated the effect of *Aloe vera* and reported significant increase in RBC, PCV and TLC in group fed with mixed plant diet. Effect of *Aegal marmelos* and *Nelumbo nucifera* was studied by Vinodhini (2010) and Pratheepa *et al*. (2010) who revealed a significant increase in red blood cells, haemoglobin concentration and pack cell volume in herbal drug treated fishes. Sheikhzadeh *et al*. (2011) investigated the effect of *Eucalyptus globolus* and *Zataria multiflora* essential oils. They recorded that dietary intake of *Z. multiflora* increased RBC and haematocrit. Pakravan *et al*. (2012) observed the effect of *Epilobium hirsutum* extracts and reported a significant increased WBC and insignificant increase in RBC, haemoglobin and haematocrit.

Oreochromis mossambicus:
The effect of dietary ginseng herb (Ashraf and Goda, 2008) and *Andrographis paniculata* (Prasad and Mukthiraj, 2011) on haematology of *O. mossambicus* was evaluated. Prasad and Mukthiraj (2011) reported significant increase in RBC, WBC, Hb, PCV and MCHC whereas significant decrease in MCV and MCH was noticed. In hybrid tilapia, effect of *Allium sativum* was evaluated by Ndong and Fall (2011) who reported significantly increased total leucocytes count in the treated fishes.

Oreochromis niloticus:
Shalaby *et al*. (2006) studied the effect of *Allium sativum* and Chloramphanicol and reported significantly increased RBC, Hb and PCV level in treated fishes. The values of red cell indices such as MCV, MCH and MCHC were also significantly different in *Allium sativum* fed fishes. Similarly, Aly *et al*. (2008) reported enhanced haematocrit and TLC in *Echinacea* (a herbal stimulatory agent) treated group of *O. niloticus*.

Pangasianodon hypophthalmus:
The effect of aqueous extract of *Garcinia gummi-gutta* on hematological parameters was evaluated by Prasad and Priyanka (2011). They reported a significant increase in erythrocytes, leucocytes, thrombocytes, haemoglobin, pack cell volume, MCHC in *Garcinia gummi gutta* treated fishes.

Onchorhynchus mykiss:
Farahi *et al.* (2010) and Fazlolahzadeh *et al.* (2011) studied the effect of *Allium sativum* and reported significantly increased RBC and lymphocyte count in fish fed with *A. sativum*. However, insignificant variations in haemoglobin and hematocrit, MCH and MCHC value were observed in fishes fed with *A. sativum* mix diet. Significantly decreased MCV values at higher dose of *A. sativum* mixed diet were noticed.

Carassius auratus: Harikrishnan and Balasundaram (2008) investigated the individual and combined effect of aqueous and ethanolic extract of tri-herbs including *Azadirachta indica*, *Cucuma longa* and *Ocimum sanctum* on fish infected with *Aeromonas hydrophila*. They reported significantly higher RBC count, haemoglobin and hematocrit values and slight change in MCH, MCV and MCHC in infected group as compared to control.

Increase in haematological parameters in plant extract treated organism may be due to the phyto-constituents like flavonoids, tannins, phenols and flavonols etc.present in the plant extract. Most of the constituents have haematological inducing factors that influence the production of blood from the bone marrow (Ganong, 1997). These chemicals can stimulate the formation and secretion of erythropoietin in the stem cells of animal which is the humoral regulator of RBC production (Ohlsson and Aher, 2006, Oyedemi *et al*., 2011, Ozougwu, 2011 and Mbaka and Owolabi, 2011). Due to these phytochemicals, plants are used as blood building herbs. Red cell

indices are particularly important for the diagnosis of anemia in most animals (Coles, 1986).Change in blood indices may be attributed to the defense reaction which occurs by stimulation of erythropoiesis.

Thus, some plants serve as blood booster and could be used as differential herbal hematinics. Use of medicinal plants as herbal remady for the mainteinence of good health may be helpful in production of healthy fishes and improving aquaculture.

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''भारतीय संस्कृति तथा भारतीय स्वभाव''

डॉ. हरनाम सिंह अलरेजा

शोध सारांष

भारतीय संस्कृति अत्यन्त प्राचीन होने के कारण एक विषाल स्वरूप को अपने अंदर समेटे हुए है तथा प्रवासी जातियों के आगमन और उनकी संस्कृतियों के समिश्रण से, भारतीय संस्कृति अति–विराट हो गई है। इसमें परस्पर विरोधी विधान, और नियम भी है, जो इसके वैचारिक स्वतंत्रता को स्पष्ट करते है। किन्तु क्या कारण है कि इतनी महान संस्कृति के रहते आज एक भारतीय व्यक्ति का दृष्टिकोण भ्रष्ट और अवैज्ञानिक है? भारतीय संस्कृति की विषेषताओं का प्रभाव एक भारतीय व्यक्ति के स्वभाव पर किस प्रकार पड़ा है। यही इस शोध पत्र का विषय है। शोध पत्र की रूप रेखा इस प्रकार है –

परिचय

जब हम भारतीय संस्कृति, दर्षन, धर्म, समाज, चिंतन तथा भारतीय नैतिक अवधारणाओं का सिलसिलेवार अध्ययन करते है तो यह ज्ञान सर्वविदित हो जाता है कि भारतीय संस्कृति अपने तात्कालिक मूल स्वरूप में, इस धरती की विषिष्ट और बेजोड़ संस्कृति तो थी ही, पर यह अद्‌भूत और अविष्वसनीय रूप से सर्वश्रेष्ठ, तब और हो गई जब यहाँ की भौगोलिक समृद्धता और आहार की प्रचुरता से आकृष्ठ अनेक विदेषी जातियों, बर्बर समूहों का यहाँ आगमन हुआ। उनकी भी अपनी एक संस्कृति थी जीवन दर्षन तथा परंपराएँ थी। जब भारतीय संस्कृति के साथ उस प्रवासी संस्कृति का संविलयन, सम्मिश्रण, समन्वयीकरण हुआ तो इसका परिणाम यह निकला कि भारतीय संस्कृति का विषाल, विराट समृद्ध और उर्वर स्वरूप हो गया और यह हतप्रभ करने वाले विस्मादी और आष्चर्यजनक रूपों से अपनी बहुआयामी विषेषताओं द्वारा प्रकट होने लगी।

हम वैदिककाल की मान्यताओं और उस समय रचित मानव जीवन को स्थापित और सुरक्षा प्रदान करने वाले व्यावहारिक एवं प्रायोगिक मंत्रो, श्लोकों की भाषा और भाव को देखते है। इनमें धरती पर रहने वाले लोगों के कल्याण हेतु की गई प्रार्थनाएँ और आह्‌वान अदभूत है। उपनिषदों में गुरू–षिष्य, राजाओं और ऋषियों के गूढ़तत्व ज्ञान और मानव अस्तित्व संबंधी ज्वलंत विवेचनाओं से अचंभित हो जाते है। यही नहीं रामायण और महाभारत जैसे महाग्रन्थों के गाथाओं और घटनाओं द्वारा सांकेतिक रूप से सृजित विभिन्न व्यक्तिगत, नैतिक, सामाजिक, आर्थिक और आध्यात्मिक सिद्धान्तों तथा गीता के व्यक्ति और समाज के कर्त्तव्यों की अद्‌भूत समन्वयकारी व्याख्याओं से स्तब्ध हो जाते है। इसके अलावा षठ–दर्षन के विभिन्न आयामों, चार्वाक, जैन, बौद्ध, आजीवकों के नास्तिक और भौतिक, विषिष्ट विचारधाराओं से कोई भी मुग्ध हो सकता है। यह बिल्कुल सत्य है कि – ''समकालीन भारतीय संस्कृति अपनी चित्रवर्ण योजना में रंगों की विविधता के कारण अधिक समृद्ध है। यह सैकड़ों लोकरूपों और साथ ही अनेक उपसांस्कृतिक और धार्मिक परंपराओं का प्रतिनिधित्व करती है, जो प्रकार्यात्मक तथा सन्तुलित एवं सामंजस्यपूर्ण प्रतिरूपों में एक साथ घुलमिल गए है।''[1]

विभागाध्यक्ष (दर्षनषास्त्र)शासकीय दिग्विजय महाविद्यालय राजनांदगांव (छत्तीसगढ़)

शोध विषय तथा समस्या

यह तो सर्वमान्य और सहज स्थापित तथ्य है कि किसी भी देष की संस्कृति और उसके मूल्यों का प्रभाव उस देष में रहने वाले व्यक्ति के व्यक्तित्व और जीवनषैली पर पड़ता है। हम किसी भी व्यक्ति की सोच, दृष्टिकोण उसके व्यवहार से किसी भी देष के सांस्कृतिक मूल्यों का अनुमान लगा सकते है। जब हम इतनी प्रदीर्घ और विषाल तथा मानवीय मूल्यों को स्थापित करने वाली भारतीय संस्कृति के होते हुए एक भारतीय के व्यक्तित्व और जीवनषैली को देखते है तो आष्चर्य होता है कि वह अपनी समृद्ध संस्कृति के आदर्ष कथनों को जगह–जगह उद्धृत करता है, लेकिन उसकी व्यवहारिक जीवनषैली बिल्कुल इनके विपरीत होती है। जहाँ भी उसे अनैतिक और भ्रष्ट व्यवहार करना होता है वह निसंकोच करता हैं। वह अपने जीवन में वैज्ञानिक और तार्किक महत्ता से परिचित होते हुये भी अंधविष्वासी और अमानवीय क्रियाएँ करता है। उसे अपने देष के संविधान और नियमों की परवाह नहीं होती है। वह किसी भी प्रकार के अषुभ और गलत कार्यों को करने के बाद भी अपराधबोध से ग्रस्त नहीं होता। लेकिन वह बाते बड़ी–बड़ी करता हैं उसके विचार और व्यवहार में अंतर हैं उसे अपनी संस्कृति के मूल्यों और परंपराओं से प्रेम है, लेकिन उसकी जीवनषैली और व्यवहार में वह शुभता दृष्टिगोचर नहीं होती है। सभी प्रकार के विरोधाभासी और असंगत विचारों से सहमत वह एक विखण्डित व्यक्तित्व जैसा दिखलायी पड़ता है। एक भारतीय अपने स्वभाव में, व्यवहार में, जीवन में, ऐसा क्यों है? इसी की जांच करने का प्रयास इस शोध पत्र का विषय है। सांस्कृतिक विषेषताओं की विवेचना से इस समस्या को समझाने का प्रयास किया गया है।

व्याख्या तथा विवेचना

भारतीय संस्कृति की अर्वाचिनता, ऐतिहासिकता और काल तथा रचनाओं से इसका स्वरूप अति विराट है। इसी विषालता को, इसकी मूल विषेषता मानकर, जब इसे समझने का प्रयास किया जाता है तो इसे और जटिल और भव्य बनाने वाली इसकी दूसरी केन्द्रीय विषेषता का ज्ञान हो जाता हैं। अन्य संस्कृतियों के विपरीत भारतीय संस्कृति की असाधारणता इसकी धार्मिक–दार्षनिक वैचारिक तथा व्यावहारिक स्वतंत्रता है। शास्त्रार्थ, पक्ष–प्रतिपक्ष, वाद–विवाद की मानयोग्य और स्वस्थ परंपरा ने इसके स्वरूप को अनेकार्थक और विरोधाभासी आकार दे दिया है। प्राचीन काल में हम एक वेदान्ती और बौद्ध, योगी और जैन मुनि, वैष्णव और तांत्रिक, मीमांसक और न्याय–वैषेषिक समर्थक जैसे अनेक विचारधाराओं पर आस्था रखने वाले को बिना किसी कठनाई के साथ–साथ रहते हुए देखते है तो इसके वैचारिक स्वतन्त्र का अनुमान हो जाता है। यही नहीं यदि कोई शोधार्थी यह जानने का प्रयास करे कि प्रवासी जातियों के आगमन के पूर्व भारतीय सांस्कृतिक मूल्य और परंपराए क्या थी? तो उसका कार्य इसलिए असंभव हो जाएगा क्योंकि अनेक संस्कृतियों और उनके मूल्यों का भारतीय संस्कृति में इस कदर अन्तर्भुक्तीकरण और समन्वय हुआ है कि उन्हें अब अलग–अलग नहीं जाना जा सकता है। भारतीय संस्कृति ने उन सभी मूल्यों और परंपराओं को अपने अंदर आत्मसात कर उन्हें, अपना ही अंग बना लिया है। इसे स्पष्ट करते हुये संस्कृति विचारक श्यामाचरण दुबे अपनी पुस्तक ''परंपरा और परिवर्तन'' में लिखते है कि – ''भारत का दीर्घ इतिहास, इसकी बहुरेखीय सांस्कृतिक प्रक्रिया नस्ल, संस्कृति और धर्म की विविधता, जनता के विभिन्न वर्गों तथा समूहों के विदेषी संस्कृतियों से भिन्न–भिन्न प्रकार के संपर्क तथा उसका प्रभाव और आधुनिक भारत में पुनर्जागरण के अंतर्गत अपनाए गए विविध मार्ग, इन सबके कारण भारतीय परंपरा के मूल तत्वों के पहचान की क्रिया

अत्यन्त कठिन हो जाती है।''[2] इसे एक रूपक से भी स्पष्ट कर सकते है कि भारतीय संस्कृति तेज धारा में नदी की तरह बहता ऐसा विषाल समुद्र है, जिससे असंख्य धाराए फूटकर बाहर ही नही निकलती वरन अनेक कुएँ, झील, नाले, बावड़िया इसमें समाहित होती रहती है। इसकी स्वतंत्रता के कारण अनेक विचाराधाराओं ने, इसके बरगद के पेड़ जैसे विषाल स्वरूप का आश्रय लेकर, अपनी उपजाऊ शक्ति से यहाँ नवीन और अनोखे मार्ग का प्रस्फूटन और अविष्कार कर लिया है।

भारतीय संस्कृति की उपर्युक्त विवेचना से इसके विषाल स्वरूप के ज्ञान के साथ इस स्वरूप की परस्पर विरोधी विषेषताओं के सह–अस्तित्व से उपजी विसंगतियों का भी प्रत्यक्ष होता है। इसके अंदर अनेक रूप, उनके दृष्टिकोण तो है ही और व्यवहार में इनका प्रकटीकरण भी अलग–अलग प्रकार से होता है। एक ओर तो यह उदारवादी, महान, कल्याणकारी और मानवतापूर्ण है दूसरी ओर इसके विपरीत यह अपने सामाजिक व्यवहार में अमानुषिक और ऊँच–नीच के भेदभाव को महत्व देती है। इसे इस कथन से समझाया जा सकता है कि – ''विस्मय की बात यह है कि हिन्दू धर्म ने एक ओर चिंतन और दर्षन के क्षेत्रों में गौरवषाली ऊचाइयां प्राप्त की, जबकि दूसरी ओर उसी धर्म ने एक अपने सामाजिक ढांचे के अन्तर्गत जनसमुदाय के बहुत बड़े भाग के शोषण, अपमान और अधःपतन को सहन नहीं किया अपितु प्रोत्साहित भी किया। ..... हिन्दू संस्कृति की कुछ महान उपलब्धियों का मानवजाति की समूची विरासत में बहुमूल्य योगदान है, परन्तु इसके साथ ही हिन्दू–संस्कृति मानव की मानव के प्रति अमानुषिकता के विषय में अन्धी, बहरी और गूंगी रही।''[3]

भारतीय संस्कृति के विरोधाभासी दृष्टिकोणों को इस प्रकार व्याख्यायित किया जा सकता है। जब हम भारतीय संस्कृति में प्राचीन चार पुरूषार्थों के संपूर्ण विवेचन तथा व्यक्ति के जीवन की योजना पर आधारित आश्रम व्यवस्था तथा स्वभावानुकूल वर्णव्यवस्था का अवलोकन करते है तो यह बिल्कुल स्पष्ट हो जाता है कि भारतीय संस्कृति का जीवन दर्षन, सामाजिक संरचना तथा मूल्यों की नींव पर खड़ा है। वह अपने चिंतन में सामाजिक जीवन को सर्वोच्च तथा प्रमुख मानता है। देखा भी जाए तो उसकी सभी अवधाराणाओं में कहीं न कहीं सामाजिक विधानों को मूल्यवान और सर्वोत्कृष्ठ मानते हुये, कठोरतापूर्वक पालन पर बल दिया जाता है। सारे भारतीय त्यौहार, परंपराएँ, देवी–देवता जैसे राम–लक्ष्मण, कृष्ण, षिव, गणेष, दुर्गा आदि का उद्देष्य समाज में शुभ और न्याय की स्थापना करना हैं। लेकिन इसके साथ ही भारतीय संस्कृति की एक महत्वपर्ण दृष्टि यह भी है कि जीवन शैली के रूप में व्यक्ति का जगत के प्रति निषेध या लौकिक अनुभवों के प्रति प्रेषकवत् अवलोकनकर्ता के तटस्थ और निलिप्त व्यवहार को सर्वोच्च सम्मान प्रदान किया गया है। यह बतलाया गया है कि पारलौकिक जीवन ही मूल तत्व साध्य, लक्ष्य या उद्देष्य है और इस हेतु साधन का प्रमुख बिंदु अलिप्तवत साक्षीभाव रखते हुए जगत या लौकिकता को स्वप्नवत मानना हैं। अब एक व्यक्ति, जो जगत को स्वप्नवत् मानते हुए सांसारिक क्रिया–कलापों के प्रति तटस्थ और निलिप्त साक्षी–भाव रखता हो वह सामाजिक प्रतिबद्धता उसके विकास और मूल्यों के प्रति कितना जागरूक रह पाएगा? यदि सांसारिक पदार्थों से वैराग्य और सम्बन्धों के प्रति विरक्ति तथा सब कुछ यही छोड़कर जाना है जैसे प्रत्यय गहरे हो जाए तो समाज और उसके विधान तुच्छ और बंधनकारी ही हो जाएंगे।

इसी प्रकार की विरोधाभासी मान्यताएँ हमें नैतिक धार्मिक विचारधाराओं में भी दृष्टिगत होती है नैतिक मूल्यों के भिन्न–भिन्न परिस्थितियों पर इतने प्रष्नोत्तर तथा धार्मिक पद्धतियों पर तर्क–वितर्क विचार मंथन हुए है कि कहीं पर जो विधान, व्यवहार, नियम सत्य दिखलाया गया है, दूसरे किसी स्थान पर उसके विलोम रूप को प्रतिष्ठित किया गया है। सत्य–असत्य, शुभ–अषुभ, पवित्रता–अपवित्रता, हिसां–अहिंसा, अपराध और प्रायष्चित आदि के अलग–अलग अनेक मापदण्ड है। ''आवष्यक बात यह है कि हिन्दू परंपरा ने हमेषा नैतिक प्रोत्साहन के प्रति एक सुविधाजनक विखंडित प्रतिक्रिया की अनुमति दी है। सही और गलत की कोई निर्विवाद परिभाषाएँ नहीं है। एकमात्र समरूप बात है अंतिम परिणाम।''[4]

भारतीय जीवनशैली में आदिम वृक्ष–पूजा, पशु–पूजा, पूर्वज–पूजा, जादू–टोना, तंत्र–मंत्र–यंत्र, अनेक अंध–विष्वासी अनुष्ठानों, विचित्र प्रकार के कर्मकांडों से लेकर मूर्ति–पूजा, अमूर्त ब्रह्मचिंतन, पौराणिक प्रतीकों की आधुनिक व्याख्या और कई प्रकार के अनिष्वरवादी सिद्धान्त भी दिखलाई पड़ते है। हम इस ग्लोबल युग में रहने वाले उच्चषिक्षित भारतीय वैज्ञानिक, प्रोफेसर्स, डॉक्टर्स, जैसे लोगों को अजीबों–गरीब क्रियाओं का पालन करते देख सकते है।'' बालों का बढ़ावा, दान, तीर्थयात्रा, वादा, उपवास, तावीज, यज्ञ, किसी विषेष श्लोक को दोहराना, बंदरो या गायों को खिलाना–कोई भी चीज हमारे जीवन के अपरिवर्तिनीय खांचे को बदल सकती है, यह अदम्य विष्वास हिन्दूओं को एक प्रफूल्लता प्रदान करता है, जो पूरी तरह से तिरोहित नहीं होता।''[5] सीधा सा और स्पष्ट निष्कर्ष है कि भारत में निवासरत असंख्य जाति–समूहों, अनेक धार्मिक विष्वासों, अलग–अलग भौगोलिक परिस्थितियों तथा सबसे बड़ी विषेषता अपने तरीके से कुछ भी करने का स्वातन्त्र्य देखकर यह तय हो जाता है कि यहाँ कोई एक सामाजिक, नैतिक या धार्मिक विधान को सार्वभौमिक या अनिवार्य बनाया नहीं जा सकता है। प्राचीन काल से चली आ रही इस विविधता पूर्ण परंपरा को कोई एक रूप देना संभव नहीं है।

प्रभाव तथा परिणाम

इतनी उदार और स्वतंत्रता प्रदान करने वाली भारतीय संस्कृति जिसमें सार्वग्राहकता, मिश्रणषीलता, निरन्तरता, बहुलता और विविधता है, के प्रभाव तले जीने वाले एक भारतीय की मानसिकता और व्यक्तित्व को देखकर हैरानी होती है। एक भारतीय की सोच और व्यवहार में भिन्नता है जो उसके दो मुहे व्यक्तित्व को प्रकट करती है। वह बाते बड़ी–बड़ी करता है लेकिन उनका पालन नहीं करता है उसका व्यक्तित्व बनावटी लगता है। वह आधुनिक दिखने के साथ–साथ आदिम परंपराओं से भी चिपटा होता है। वह अपने संस्कृति के श्रेष्ठत्व के दंभ से भरा, नवीन अनुसंधानों को अपनाने में उदासीन रहता है। वह सारी इच्छाएँ रखता है लेकिन यह जतलाता है कि उसको मोह नहीं है। अपने आध्यात्मिक और धार्मिक रूप का प्रदर्षन करता है, पर वह वैसा होता नहीं है। आधुनिक विचारक पवन के वर्मा ने विवेचन कर बतलाया है कि ''भारतीयों ने जान–बुझकर एक पारलौकिक छवि को बढ़ावा दिया है वे भौतिकवादी दुनिया की सभी गतिविधियों से ऊपर उठे हुये लोगो के रूप में देखा जाना पसंद करते है।''[6] एक भारतीय का व्यक्तित्व विखण्डित ही दिखलायी देता है वह अपने देष और समाज के प्रति जवाबदेह नही हेाता है लेकिन कर्त्तव्यों की बात के महान उदाहरण उसके पास होते है। ऐसा क्यों है? इसके दो मुख्य कारण हो सकते है पहला–यह की हमारी भारतीय संस्कृति की उदारता और अथाह नियमों

का उप–परिणाम एक भारतीय के व्यक्तित्व पर ऐसा पड़ा है कि वह किसी भी एक नियम या सिद्धांत के प्रति दृढ़ निष्चयी नहीं है। उसे लगता है कि सारे नियम तथा विधान समायनुसार परिवर्तित हो सकते है। दूसरे शब्दों में ''प्रतिमानों को धता बताने और संहिताओं का अर्थ तोडने मरोडने के अनेक तरीके है।''[7] हम कह सकते है कि उसका यह व्यक्तित्व विविध समाधानो वाली हमारी विरोधाभासी विचारधाराओं पर आधारित संस्कृति का प्रच्छन्न परिणाम है। दूसरा–एक भारतीय के अंदर विज्ञान और उसके महत्व के प्रति कभी भी सम्मान का भाव नहीं होता, उसके स्वाभाव में वैज्ञानिक चेतना का अभाव है।

समाधान

यदि यह मान लिया जाए कि भारतीय संस्कृति के अलग–अलग विरोधाभासी धारणाओं का कारण, उसके प्राचीनता से आधुनिकता तक, मानव सभ्यता के विकास के उत्तरोत्तर चरण या अवस्थाएँ है। तो भी हमें कोई एक दृष्टिकोण को आधार बनाना पड़ेगा जिससे हमारा नजरिया स्पष्ट और केन्द्रित, नियमों पर चलकर, हमें ईमानदार बना सकें। प्रख्यात खगोल वैज्ञानिक जंयत विष्णु नार्लीकर ने एक स्थान पर लिखा है कि ''पष्चिमी जगत जहां विज्ञान और प्रोधोगिकी को अपना जीवन स्तर सुधारने के लिए बखूबी इस्तेमाल कर रहा था, वही सोलहवी से अठारवी शताब्दी में भारतीय लोग विज्ञान की क्षमता से अनभिज्ञ थे या उन्होनें इसकी परवाह नहीं की।[8] लेकिन सोलहवी या उठारहवीं शताब्दी नहीं आज एक्कीसवी शाताब्दी में भी भारतीय को देखे तो वह न तो वैज्ञानिक महत्ता के प्रति जागरूक है न हि अनेक अंधविष्वासी क्रियाओं के प्रति पुनविष्लेषण का दृष्टिकोण रखता है। एक उदाहरण देकर भारत की विज्ञान यात्रा में नार्लीकार जी बतलाते है कि ''सांख्यकी संबंधी आंकडे यह साबित कर देते है कि विवाह से पूर्व जन्म पत्री मिलाने से वैवाहिक जीवन की गुणवत्ता पर कोई प्रभाव नहीं पड़ता है पर अभी भी विवाह के पूर्व जन्म पत्री मिलाने का रिवाज है। षिक्षित और उच्च वर्ग में भी इसका प्रचलन है, जबकि इस बात का न तो कोई वैज्ञानिक कारण है और न विभिन्न ग्रहो की स्थिति का मानव जीवन पर लेषमात्र भी प्रभाव पड़ता है पर फिर भी तमाम महत्वपूर्ण फैसले जैसे– मंत्रालय का गठन, नए मकान में प्रवेष, कार खरीदना नया व्यापार शुरू करना आदि तथाकथित शुभ–मुहर्त देखकर किए जाते है। इसी तरह हमारा षिक्षित समाज भी तथाकथित वास्तुषास्त्र से काफी प्रभावित है।''[9] कई प्रकार की अनुपयोगी और निरर्थक मान्यताओं को वैज्ञानिक दृष्टि से जाँचा जा सकता है तथा वैज्ञानिक चेतना को अपने जीवन में स्थान देकर इतिहास परपंरा, संस्कृति, दर्षन और धर्म का सतत पुनर्विष्लेषण भी किया जा सकता है। इसी प्रकार अपनी संस्कृति की स्वतंत्रता की शक्ति का दुरूपयोग न करते हुये यदि हम संवेधानिक और नैतिक नियमों के प्रति अटल और सम्मान का निष्चय कर ले तो आने वाली भावी पीढ़ी को ठोस दृष्टिकोण देने के साथ अपने व्यक्तित्व और बुद्धि को ईमानदार और एकाग्र बनाया जा सकता है।

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(2) वही, पृष्ठ –44

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(5) वही, पृष्ठ – 105

(6) वही, पृष्ठ – 70

(7) दुबे, श्यामाचरण भारतीय समाज पृष्ठ – 42, नेषनल बुक ट्रस्ट, इंडिया नई–दिल्ली।

(8) नारलीकर, जयंत विष्णु ''भारत की विज्ञान यात्रा'' पृष्ठ – 50 प्रभात प्रकाषन नई–दिल्ली।

(9) वही, पृष्ठ – 103

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मुक्तिबोध : सवालों के 'अँधेरे में' संवेदना के उजाले!

डॉ. चन्द्रकुमार जैन

सार

एक लोकतांत्रिक समाज का नागरिक होने के नाते हम नागरिक चेतना के अनेक सवालों के सामने खुद को पाते हैं। इसमें नागरिक कहाँ खड़ा है? लेखन क्या है? सृजनात्मकता किस चिड़िया का नाम है ? रचना प्रक्रिया की बुनियादी मांग क्या है ? नागरिक चेतना और लेखन के आपसी सम्बन्ध क्या हैं? हमारे अपने समाज में लोकतन्त्र, लेखन और समाज के क्या रिश्ते हैं? उन्हें कैसा होना चाहिए? वैश्वीकरण के दौर में साहित्य की क्या भूमिका हो सकती है ? ऐसे सवालों से दो चार होते हुए जब हम हिन्दी की प्रगतिवादी कविता और नई कविता के मजबूत सेतु के रूप में प्रतिष्ठित मुक्तिबोध पर एकाग्र होते हैं तब सवाल–दर–सवाल और जवाब–दर–जवाब रचनाकर्म के कई अहम पहलू खुद–ब–खुद खुलने लगते हैं, मानों मुक्तिबोध के ही शब्दों में एक कदम रखने पर सौ राहें फूटने लगती हैं।

गजानन माधव मुक्तिबोध तार सप्तक के पहले कवि थे। मनुष्य की अस्मिता, आत्मसंघर्ष और प्रखर राजनीतिक चेतना से समृद्ध उनकी कविता पहली बार तार सप्तक के माध्यम से सामने आई। पुरानी और प्रगतिशील कविता के बीच एक सेतु के रुप में चर्चित मुक्तिबोध कहानीकार भी थे और समीक्षक भी और पत्रकार भी। नागपुर में रहकर ही उन्होंने महत्वपूर्ण काव्य रचनाओं का सृजन किया। 'कोशिश कर कुछ ऐसा कहने की जिससे क्षितिज हो सके और अधिक विस्तृत जिससे हृदय हो सके और अधिक आलोकित', पीमेन पांचे की यह काव्य पक्तियां गजानन माधव मुक्तिबोध के रचानाकर्म पर सटीक बैठती हैं।

हिन्दी कविता के महानतम सर्जकों में से एक गजानन माधव मुक्तिबोध के निधन के पचास साल पूरे हो गए हैं । सितंबर उन्नीस सौ पैंसठ के नया ज्ञानोदय में कवि श्रीकांत वर्मा का एक लेख छपा था जिसमें उन्होंने कहा था 'अप्रिय' सत्य की रक्षा का काव्य रचने वाले कवि मुक्तिबोध को अपने जीवन में कोई लोकप्रियता नहीं मिली और आगे भी, कभी भी, शायद नहीं मिलेगी। कालांतर में श्रीकांत वर्मा की आशंका गलत साबित हुई और मुक्तिबोध निराला के बाद हिन्दी के सबसे बड़े कवि के तौर पर न केवल स्थापित हुए बल्कि आलोचकों ने उनकी कविताओं की नई–नई व्याख्याएं कर उनको हिंदी कविता की दुनिया में शीर्ष पर बैठा दिया। मुक्तिबोध की बहुचर्चित कविता 'अँधेरे में' ने भी अपनी अर्धशती पूरी कर ली है।

कहना न होगा कि अँधेरे की शब्दावली में अपने आस–पास पसरे अँधेरे के अनगिन सवालों की शिनाख्त करने वाले मुक्तिबोध की बेकली को बकलम मुक्तिबोध ही समझने का इस से बेहतर अवसर संभव नहीं है। लिहाजा, समय आ गया है कि इस बात की ईमानदार पड़ताल की जाए कि मुक्तिबोध की रचनाओं में संघर्ष दिखाई देता है वह उनका अपना संघर्ष मात्र है या फिर पूरे मध्य वर्ग का, समूची मानवता का और हमारे मौजूदा समय का भी संघर्ष है।

प्रसिद्ध कवि आशोक वाजपेयी ठीक कहते हैं कि बड़ा लेखक वह है जिसमें हम हर बार नये अर्थ को ढूढते हैं। जो कुछ मुक्तिबोध के जमाने में अंधेरे में था, आज वही उजाले में है। वो सच आज सबके सामने है जिसको मुक्तिबोध अपने समय

प्राध्यापकहिन्दी विभागए शास दिग्विजय स्नातकोत्तर स्वशासी महाविद्यालयए राजनांदगांवएछत्तीसगढ़ मो. 09301054300

में महसूस करके लिख चुके थे। बात साफ है कि मुक्तिबोध के रचना कर्म की परिधि और उसके केंद्र दोनों में हमारे आज के दौर के सवालों की समझ और उनके जवाब हासिल किए जा सकते हैं। मुक्तिबोध को लक्षित–मूल्यांकित करने का क्रम अभी जारी है। छायावादी काव्यधारा में 'निराला' और नयी कविता में मुक्तिबोध का व्यक्तित्व अपवाद की सीमा तक विशिष्ट था, इसमें दो मत नहीं है।

प्रख्यात कवि राजेश जोशी के अनुसार, जैसा कि उन्होंने बीबीसी के लिए रंगनाथ सिंह से हुई बातचीत में 11 सितम्बर 1914 को कहा कि मुक्तिबोध ने 'एक साहित्यिक की डायरी' में 'एक लंबी कविता का अंत' शीर्षक के अंतर्गत लिखा है, ऐसी स्थिति में जबकि समाज में संजीवनकारी उत्प्रेरक आंदोलन या ऐसी संगठित शक्ति नहीं है, एकप्रसिद्ध कवि आशोक वाजपेयी ठीक कहते हैं कि बड़ा लेखक वह है जिसमें हम हर बार नये अर्थ को ढूढते हैं। जो कुछ मुक्तिबोध के जमाने में अंधेरे में था, आज वही उजाले में है। वो सच आज सबके सामने है जिसको मुक्तिबोध अपने समय में महसूस करके लिख चुके थे। बात साफ है कि मुक्तिबोध के रचना कर्म की परिधि और उसके केंद्र दोनों में हमारे आज के दौर के सवालों की समझ और उनके जवाब हासिल किए जा सकते हैं। मुक्तिबोध को लक्षित–मूल्यांकित करने का क्रम अभी जारी है। छायावादी काव्यधारा में 'निराला' और नयी कविता में मुक्तिबोध का व्यक्तित्व अपवाद की सीमा तक विशिष्ट था, इसमें दो मत नहीं है।

प्रख्यात कवि राजेश जोशी के अनुसार, जैसा कि उन्होंने बीबीसी के लिए रंगनाथ सिंह से हुई बातचीत में 11 सितम्बर 1914 को कहा कि मुक्तिबोध ने 'एक साहित्यिक की डायरी' में 'एक लंबी कविता का अंत' शीर्षक के अंतर्गत लिखा है, ऐसी स्थिति में जबकि समाज में संजीवनकारी उत्प्रेरक आंदोलन या ऐसी संगठित शक्ति नहीं है, एक संवेदनशील मन जिसमें अब तक अवसरवादी कौशल और लाभ–लोभ की समझदारी विकसित नहीं हुई है, केवल अपने को निस्सहाय महसूस करता है. वह लिखते हैं, यदि वो कवि होता है तो सहज मानवीय आकांक्षाओं के सामाजिक वातावरण के अभाव में उसके काव्यात्मक रंग अधिक श्यामल, अधिक बोझिल और अभावग्रस्त हो जाते हैं. यह डायरी 1963 की है यानी 'अंधेरे में' के रचनाकाल के लगभग आसपास की.यह वह समय और सामाजिक वातावरण था जिसने मुक्तिबोध की कविता को गहरे अंधेरे, धुंधले और धूसर रंग दिए।

स्मरण रहे कि 'अंधरे में' मुक्तिबोध की प्रसिद्ध कविता है। यह कविता परम अभिव्यक्ति की खोज में जिस तरह की फैंटेसी बुनती है लेकिन अपने मूल में यह कविता ऐसे अंधेरे की पड़ताल करती है जो देश की आजादी के बाद की व्यवस्था का अंधेरा है, इस लोकतंत्र का अंधेरा है। 'अंधेरे में' पूंजी की दुनिया व रक्तपाई वर्ग द्वारा पैदा की गई क्रूर, अमानवीय व शोषण की हाहाकारी स्थितियों से साक्षात्कार करती है। यह हिन्दी कविता में 'मील का पत्थर' है जिसमें 'अंधेरा' मिथ नहीं, ऐसा यथार्थ है जिससे जूझते हुए हिन्दी कविता आगे बढ़ी है। 'अँधेरे में' के कवि की कोशिश लेखन की इस आरंभतः वर्णित 'मौत की सजा' को अंततः 'परम अभिव्यक्ति अनिवार्य, आत्म सम्भवा' के रूप में पहिचानता है। यहां पहुंचकर रचनात्मकता की तलाश निष्पन्न होती है, और फिर शुरू हो जाती है –

इसीलिए मैं हर गली में
और हर सड़क पर
झाँक–झाँक कर देखता हूँ हर एक चेहरा।

और यों परम अभिव्यक्ति अपने कर्ता से बड़ी हो जाती है, मैं उसका शिष्य, वह मेरी गुरू है 1

मुक्तिबोध की कविता जिस अंधेरे से रू ब रू है, वह इन पचास सालों में सच्चाई बनकर उभरा है। उसका विस्तार ही नहीं हुआ, वह सघन भी हुआ है। यह अकस्मात् नहीं है कि कविता के सातवें खंड में रिहाई के बाद कवि ने मठ व गढ़ को तोड़ने की बात की है। वह इसलिए कि उन्होंने इन मठों व गढ़ों को बनते और इनके अन्दर पनपते खतरनाक भविष्य को देखा। कैसे हैं ये मठ व गढ़ ? आज ये पूंजी, धर्म, वर्ण, जाति के मठ व गढ में रूपांतरित हो गये है। राजनीति सेवा नहीं, मेवा पाने का माध्यम बन गई है। बड़ी बड़ी बातें की जा रही हैं। प्रगति व विकास के दावे किये जा रहे हैं। कोई गौरवान्वित हो सकता है कि हमारी संसद अरबपतियों से रौशन है। पर हमने ईमानदारी, नैतिकता, आदर्श, भाईचारा सहित जो जीवन मूल्य निर्मित किये थे, उसमें कहां तक प्रगति की है ? अब तो इस पर बात करना भी पिछड़ापन है।

हमारे पुराने महाकाव्य लोक–परम्परा से चल कर अपने बाह्य रूप में विकसित होते थे य 'अँधेरे में', इस दृष्टि से, लोक–संदर्भों से जुड़कर अपने अर्थ में विकसनशील कविता है। 'राम की शक्ति पूजा' (निराला), 'प्रलय की छाया' (प्रसाद), 'असाध्य वीणा' (अज्ञेय) के साथ, यदि परम्परागत शब्दावली का प्रयोग किया जाय, तो वह महाकविता है। सम्पूर्ण जातीय विडंबनाओं का परीक्षण वह बड़े गहरे स्तर पर करती है। स्वप्न, फंतासी और अतियथार्थवादी अनुभवों में घुला–मिला चलने वाला उनका कथानक –– रक्तालोक स्नात पुरुष का साक्षात्कार, कवि को दी गई मौत की सजा, रात का विचित्र जुलूस, मार्शल लॉ जैसा वातावरण, तिलक मूर्ति से टपकता खून, विचित्र वेश में गांधी से भेंट, भविष्य शिशु कोई कवि को सौंपा जाना और गांधी द्वारा जान शक्ति का आख्यान, कवि को पकड़कर दी गई यंत्रणा, फिर रिहाई, अभिव्यक्ति खतरों का एहसास और फिर उस परम अभिव्यक्ति की तलाश –– सांस्कृतिक पुनर्जागरण, राष्ट्रीय स्वाधीनता आंदोलन और परवर्ती जीवन का एक विराट संश्लिष्ट चित्र है, जो कविता में पहली बार, इस रूप में अंकित होता है। टिकक,गांधी और स्वयं कवि जैसे इन तीनों चरणों को मूर्तिमान करते हैं। यथार्थ का तीखा और नंगा चित्र अंकित करते कवि कहीं स्वाभाविक रूप से डरता है, पर उस भय का अतिक्रमण कर जाता है –

हाय, हाय ! मैंने उन्हें देख लिया नंगा,
इसकी मुझे और सजा मिलेगी।

इस विचित्र और भयावह शोभा–यात्रा का वर्णन कवि बड़े तात्विक रूप में करता है – गहन मृतात्माएँ इसी नगर की हर रात जुलूस में चलतीं परंतु, एक दिन में बैठतीं हैं मिल कर करती हुईं षड्यंत्र, विभिन्न दफ्तरों – कार्यालयों, केन्द्रों में, घरों में। इस पकड़ से कोई नहीं बचता या जैसा कहा गया, यहाँ सम्पूर्ण जातीय राष्ट्रीय जीवन का विश्लेषण है। और निष्कर्ष ?

अब तक क्या किया,
जीवन क्या जिया,
ज्यादा लिया और दिया बहुत–बहुत कम
मर गया देश, अरे, जीवित रह गए तुम। 2

कहना न होगा कि ऐसे अनेक सवाल हैं जिनके रू ब रू हमारा मौजूदा वक्त भी है। आज भी यथार्थ की नजर तो दूर,उसकी समझ भी जैसे गुनाह है, हमारे रहनुमाओं की निगाहों में। आज भी वह षड्यंत्र जारी है, इससे भला कौन इंकार कर सकता है ? ज्यादा लेने और बहुत–बहुत कम देने की क्या कहें, सिर्फ लेने और कुछ भी न देने की मिसालें आम बातें हैं,जिनका सही चेहरा दिखाने में मुक्तिबोध का रचना–संसार, विशेषतः उन की कविता 'अँधेरे में' पूरी तरह समर्थ है।

इस सन्दर्भ में वह सचमुच आत्म–सम्भवा है।

अँधेरे में कविता की अर्थवत्ता उसके स्वप्न चित्रमय वातावरण में है जो अपनी नाटकीय संरचना के द्वारा सीधे–सादे वाक्यों को भी काव्यात्मक गूँज से अनुरंजित कर देता है। अँधेरे में कविता को पढ़कर कोई यह महसूस किए बिना नहीं रह सकता कि यह आज का भारत है। स्वप्न चित्र जैसी एक अयथार्थ कला के द्वारा काव्यात्मक पुनः सृष्टि करके मुक्तिबोध ने एक विरोधाभास का ही चमत्कार पैदा नहीं किया, बल्कि आधुनिक हिन्दी कविता में एक कालजयी कृ ति की रचना की है। 3

भूमण्डलीकरण के तीन स्वरूप हैं–उदारीकरण, निजीकरण और मुक्त बाजार। जो लोग इस मुक्त व्यवस्था में सम्मिलित होंगे वे अपने–अपने देशों में आयात–निर्यात कानून को उदार बनायें, अपने देश के संसाधन का निजीकरण करें, स्थापना व्यय कम करें, तमाम तरह की सब्सिडी खत्म करें और अपने देश के संसाधनों का निजीकरण करें और अपने देश का हर बाजार दुनिया के कारपोरेट घरानों के लिये खोल दें। यह सब वैश्वीकरण की ऐसी कड़वी सच्चाई है जो सम्पूर्ण संसार को खासकर तीसरी दुनिया के देशों को पूरी तरह से जकड़ती जा रही है। इससे बचने का रास्ता किसी के पास नहीं है।

स्वप्निल श्रीवास्तव की इन पंक्तियों को देखें–

'घर के बाहर निकलो तो बचो,
घर में रहो तो बचो,
क्योंकि जो कुछ बचा हुआ है,
उसे नष्ट करने की कोशिश जारी है।'

दरअसल, 'अंधेरे में' कविता में मुक्तिबोध कहते हैं 'पूंजी से जुड़ा हृदय बदल नहीं सकता'। गांधी जी पूंजीपतियों को देश का ट्रस्टी मानते थे। उनका दर्शन 'हृदय परिवर्तन' पर आधारित था। उनकी समझ थी कि समाज के प्रभुत्वशाली वर्गों तथा वर्चस्ववादी जातियों व शक्तियों के हृदय परिवर्तन से समाज में समता आयेगी। गांधी जी के इन विचारों के विपरीत मुक्तिबोध का चिंतन था। वे इस 'उजली दुनिया' के पीछे फैले काले संसार को, इसकी हृदयहीनता व मनुष्य विरोधी चरित्र को बखूबी समझते थे जिसकी प्रवृति छलना व लूटना है। पूंजीवाद की यह अमानवीयता आज के समय में कही ज्यादा आक्रामक होकर हमारे सामने आई है। आज जिस 'महान लोकतंत्र' की दुहाई दी जा रही है, वह मूलतः लूट और झूठ की बुनियाद पर टिका है। यह अपनी लूट को छिपाने तथा उसे बदस्तूर जारी रखने के लिए झूठ की रचना करता है। कौन नहीं जानता कि आज कॉरपोरेट हित सर्वोपरि है लेकिन इसे अर्थशास्त्रीय शब्दावली की भूल भुलैया में ले

जाकर श्समावेशीश कहा जा रहा है। इस पूंजी से हमारे देश की प्राकृतिक संपदा, खनिज, जंगल, जल व जमीन की लूट जारी है। लेकिन इसे 'विकास' की संज्ञा दी जा रही है।

इसी तरह दुनिया की हर भाषा की जिंदगी में एक बार कोई निहायत ही निष्करुण वक्त दबे पाँव आता है और 'उसको बोलने वालों' के हलक में हाथ डालकर उनकी जुबान पर रचे–बसे शब्दों को दबोचता है और धीरे–धीरे उनके कोमल गर्भ में साँस ले रहे अर्थों का गला घोंट देता है। एक तरफ वह 'पवित्र को ध्वंस' में धकेलता है तो दूसरी तरफ वह 'अतीत में आग' लगाता हुआ, चौतरफा भय और निराशा फैला देता है। ऐसे ही वक्त के खिलाफ अंततः मंगल पांडे की बंदूक से गोली निकलती है और 1857 का गदर (?) मच जाता है। ...आज हम फिर 1857 के ही निकट पहुँच गए हैं। वे तब ये कहते हुए आए थे रू 'हम, तुम असभ्यों को सभ्य बनाने के लिए तुम्हारे देश में घुस रहे हैं।' मगर इस बार वे कह रहे हैं 'हम, तुम कंगलों को संपन्न बनाने के लिए तुम्हारे यहाँ आ रहे हैं।' ...सुनो, हम जिस 'पूँजी का प्रवाह' शुरू कर रहे हैं, वह तुम्हारे यहाँ समृद्धि लाएगी। ...लेकिन, हकीकत में यह देश को समृद्ध नहीं बल्कि, एक किस्म के 'सांस्कृतिक–अनाथालय' में बदलने की युक्ति है। वे धीरे–धीरे आपसे आपकी बोलियाँ और भाषा छीन रहे हैं।4

मुक्तिबोध ने भी लिखा है –

इतने प्राण, इतने हाथ, इतनी बुद्धि
इतना ज्ञान, संस्कृति और अंतःशुद्धि
इतना दिव्य, इतना भव्य, इतनी शक्ति
यह सौंदर्य, वह वैचित्र्य, ईश्वर–भक्ति
इतना काव्य, इतने शब्द, इतने छंद
जितना ढोंग, जितना भोग है निर्बंध
इतना गूढ़, इतना गाढ़, सुंदर–जाल
केवल एक जलता सत्य देने टाल।
छोड़ो हाय, केवल घृणा औश दुर्गंध
तेरी रेशमी वह शब्द–संस्कृति अंध
देती क्रोध मुझको, खूब जलता क्रोध
तेरे रक्त में भी सत्य का अवरोध
(कविता 'पूंजीवादी समाज के प्रति' का अंश)

समाज और साहित्य का सम्बन्ध बहुत कुछ वही है जो धरती से फूल का है। फूल धरती होता है, इसका मतलब यह नहीं है कि उसके दाल, पात, पंखुड़ी, वर्ण, गंध आदि मिट्टी हैं य कि उससे मिट्टी की–सी सोंधी गंध आती ही और रंग भी मटमैला होता है। धरती का रूप–रस फूल में नया गंध, गंध उत्पन्न करता है। इसी तरह समझना होगा कि साहित्य में भी समाज ज्यों का त्यों नहीं झलकता, बल्कि, रूपांतरित रूप में अंतरनिहित रहता है। गौरतलब है कि श्रेष्ठ साहित्य मन का लड्डू नहीं है कि जब चाहा बना लिया। श्रेष्ठ तो श्रेष्ठ, साहित्य मात्र किसी की स्वेच्छा पर निर्भर नहीं है। जब जैसा जी हुआ वैसा साहित्य कोई नहीं रच सकता। वह एक निश्चित परिस्थिति में और एक निश्चित परिस्थिति

से पैदा होता है और यह परिस्थिति उसकी स्वेच्छा को मर्यादित करती है –– यहाँ तक कि उसके विद्रोह को भी। परिस्थिति के विरुद्ध लेखक का विद्रोह भी उस परिस्थिति के द्वारा निर्धारित होता है। यह लेखक की ऐतिहासिक सीमा है। मन के लड्डू खाने की अपेक्षा अपनी ऐतिहासिक सीमा को समझने और समझकर बदलने की कोशिश करने में कहीं अधिक स्वाद है।5 इस कथन के परिप्रेक्ष्य में यदि देखें तो मुक्तिबोध ने एक ओर फैंटेसी के जरिये समाज के भीतरी चेहरे को पहचानने की दृष्टि दी, दूसरी तरफ अपनी ऐतिहासिक सीमाओं की पड़ताल कर,स्वेच्छा का नहीं, सच्चाई का साहित्य रचा और इस प्रयत्न में आश्चर्य नहीं कि उनके सामने यह प्रश्न मुंह बाए खड़ा रहा –

और, मैं सोच रहा कि
जीवन में आज के
लेखक की कठिनाई यह नहीं है कि
कमी है विषयों की
वरन यह कि आधिक्य उनका ही
उसको सताता है,
और, वह ठीक चुनाव नहीं कर पाता है।
('मुझे कदम–कदम पर')

बहरहाल, मुक्तिबोध की अंतहीन तलाश, विषयों के आधिक्य के मध्य भी जीवंत बनी रही।
मुक्तिबोध ने पूरे पूंजीवादी सुपरस्ट्रक्चर को इस अंश में चित्रित किया है –

विचित्र प्रोसेशन

बैंड के लोगों के चेहरे
मिलते हैं मेरे देखे हुओं से
लगता है उनमें कई प्रतिष्ठित पत्रकार
इसी नगर के !!
बड़े– बड़े नाम अरे, कैसे शामिल हो गए में !!
उनके पीछे चल रहा
संगीन नोकों का चमकता जंगल,
कर्नल, ब्रिगेडियर, जनरल, मार्शल
कई और सेनापति, सेनाध्यक्ष
चेहरे वे मेरे जाने बूझे से लगते
उनके चित्र समाचार पत्रों में छपे थे,
उनके लेख देखे थे,
यहाँ तक कि कविताएँ पढ़ी थीं

भई वाह !
उनमें कई प्रकांड आलोचक, विचारक, जगमगाते कविगण
मंत्री भी, उद्योगपति और विद्वान
यहाँ तक कि शहर का हत्यारा
डोमाजी उस्ताद।
(मुक्तिबोध रचनावली–2, पृ.328–30)

सत्ता हमेशा ही अपने को प्रामाणिक साबित करने के लिए मध्यवर्गीय, सुविधालोलुप बुद्धिजीवी का सहारा लेती है। ये विद्वान जो रात के जुलूस में शामिल हैं, जुलूस में शामिल दूसरे लोगों की रक्षा और उनके कृत्यों को वैधता प्रदान करना ही इनका काम है। सत्ता ने इसीलिए इनको सुविधाओं से पाट दिया है। इसीलिए ये सब लोग हत्यारी चुप्पी साधे हुए हैं। मीर तकी मीर ने शायर या कवि के मूल कर्तव्य को रेखांकित करते हुए कहा था – 'शायर हो मत चुपके रहो, इस चुप में जानें जाती हैं।' इस चुप्पी के वर्गीय आयामों को उभारते हुए मुक्तिबोध ने एकबारगी मीर की कविता के चुप्पे शायर की स्वातंत्र्योत्तर पहचान की। जानें तो सामान्य जन की ही जाएंगी। जर खरीद बौद्धिकों द्वारा गढ़े जाते संवाद इस हत्या को बौद्धिक आधार मुहैया कराने वाले ठहरे –

सब चुप, साहित्यिक चुप और कविजन निर्वाक्
चिंतक, शिल्पकार और नर्तक चुप हैं
रक्तपायी वर्ग से नाभिनाल–बद्ध ये सब लोग
नपुंसक भोग–शिरा–जालों में उलझे,
प्रश्न–सी उथली सी पहचान
भव्याकार भवनों के विवरों में छिप गए
समाचार–पत्रों के पतियों के मुख स्थूल
गढ़े जाते संवाद,
गढ़ी जाती समीक्षा,
गढ़ी जाती टिप्पणी जन–मन–उर शूल
बौद्धिक वर्ग है क्रीतदास। 7

मुक्तिबोध ने अपनी मार्क्सवादी अंतर्दृष्टि से भारतीय समाज व्यवस्था के चरित्र को फैंटेसी के माध्यम से सही–सही अंकित किया था। इसी तरह भारतीय पूंजीवादी–सामंती शोषण व्यवस्था को उन्होंने अपनी कविता 'एक स्वप्न कथा' के बिम्ब से चित्रित किया है, वहां उसके साम्राज्यवाद सहयोग को भी कलात्मक तरीके से उजागर किया –

हो न हो
इस काले सागर का
सुदूर–स्थित पश्चिम किनारे से
जरूर कुछ नाता है

इसीलिए, हमारे पास सुख नहीं आता है।

इस तरह, खोज और उपलब्धि के बीच की दुविधा या 'सस्पेंस' ही 'अँधेरे में' कविता को अद्‌भुत नाटकीयता प्रदान करती है। कथन शैली की दृष्टि से अँधेरे में एक स्वप्न कथा है, किन्तु वह सामान्य स्वप्न कथा नहीं, बल्कि, दुःस्वप्न का कथालोक है, जिसमें हर चीज प्रायः अन्यथा रूप में दृष्टिगत होती है। आत्मसंघर्ष से उत्पन्न तनाव, जटिलता,विसंगति, विडम्बना के बावजूद नामवर सिंह का यह कथन ध्यातव्य है – मेरे ध्यान में मुक्तिबोध का कविता संबंधी वह वक्तव्य भी है कि 'आज तो पोस्टर ही कविता है' और फिर यह कथन भी कि 'नहीं होती, कहीं खत्म कविता नहीं होती', मुक्तिबोध, दरअसल कल होने वाली घटनाओं की कविता ही नहीं लिख रहे थे बल्कि उस कविता के भावी काव्य–सिद्धांत के सूत्र भी फेंक रहे थे।6 इस तरह मुक्तिबोध की कविता में आज साहित्य सिद्धांतों की भावी आहट पहले ही सुनी जा चुकी थी। इसलिए,स्वाभाविक है कि उनकी कविता अँधेरे में. आज के साहित्यिक सवालों के जवाबों मद्देनजर भी एक आईने के समान है।

साहित्य का अपने शाश्वत मूल्यों के कारण भौगोलिक और सांस्कृतिक सीमाओं को लांघ जाना एक सामान्य बात है, इस पर भी हर बड़ा रचनाकार कुल मिला कर समाज विशेष की ही देन होता है और उसी समाज विशेष की भाषा, संस्कृति, परंपराओं और इतिहास के दायरे में उसकी रचनात्मकता अभिव्यक्ति पाती है। इसलिए जाहिर है कि जिस साहित्य का अपने समाज से जितना आदान–प्रदान (इंटरेक्शन) हो रहा होगा वह साहित्य उतना ही जीवंत, संवेदनशील और प्रभावशाली होगा। और, कहना न होगा कि मुक्तिबोध में यह इंटरेक्शन शिखर पर पहुंचकर जीवन के समतल और तलहटी को भी इंस्पेक्ट करने में समर्थ है। उनका साहित्य उसी संवाद का शाश्वत दस्तावेज है। वास्तव में मुक्तिबोध सफलता के दोयम दर्जे के तौर तरीकों से पूरी तरह दूर रहे। कभी कोई कपटजाल नहीं रचा। चालाकी और छल–छद्‌म से जिंदगी की ऊंची मंजिलों तक पहुँचने का कोई ख्वाब तक भी नहीं देखा। तभी तो वह दो टूक लहजे में कह गए –

असफलता का धूल कचरा ओढ़े हूँ
इसलिए कि सफलता
छल–छद्‌म के चक्करदार जीनों पर मिलती है
किन्तु मैं जीवन की –
सीधी–सादी पटरी–पटरी दौड़ा हूँ
जीवन की।
(1960–61,राजनांदगांव, मुक्तिबोध रचनावली)

स्मरण रहे कि 'अंधेरे में' मुक्तिबोध की सृजनात्मकता का सबसे उन्नत शिखर है। यह भी कि "समय बीतने के साथ चीजें अतीत की ओर जाती हैं, लेकिन 'अँधेरे में' एक ऐसी कविता है जो अतीत की ओर नहीं, बल्कि भविष्य की ओर गई है. वह इतिहास बनने से इनकार करती रही और वक्त में आगे चलती रही है." 8 दरअसल, मुक्तिबोध जीवनपर्यंत इसी समस्या से जूझते रहे कि अपने चिंतन और चिंता को रचना का विषय कैसे बनाया जाए, जिससे कि साहित्य के स्वधर्म पर कोई आंच न आए। मुक्तिबोध किसी भी कीमत पर साहित्य के स्वधर्म से समझौता नहीं कर सकते थे चाहे उन्हें अपनी कविताओं को कई बार लिखना ही क्यों न पड़े या उसे अधूरा ही क्यों न छोड़ना पड़े। एक रचनाकार

के रूप में मुक्तिबोध की चिंताएं साहित्यिक ही थीं, इसीलिए वे अपनी रचनाओं से लगातार जूझ रहे थे। इसलिए अज्ञेय का यह कहना उचित प्रतीत नहीं होता कि मुक्तिबोध की बेचौनी के केंद्र में कविकर्म न होकर समाज है।

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   तिमिर में झरता समय सं– राजेन्द्र मिश्र पृष्ठ संख्या– 222

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कालिदास के महाकाव्यों में तत वाद्य–एक अध्ययन

टिकेश्वर प्रसाद जायसवाल

शोध सारांश– प्रस्तुत शोध पत्र संस्कृत साहित्य के सर्वोत्कृष्ट महाकवि कुलगुरू कालिदास के महाकाव्यों में सङ्.गीत के तत्वों को स्पष्ट करने के दृष्टिकोण से लिखा गया है। सङ्.गीत मानव जीवन को महनीय एवं कमनीय बनाए रखते हुए परमानन्द तक पहुँचने का सुगम मार्ग है। संस्कृत के महाकवियों ने काव्य रचना में सङ्.गीत की समावेशता पर विशेष ध्यान दिया है। महाकवि कालिदास के महाकाव्य 'रघुवंशम्' एवं 'कुमारसंभवम्' इन दोनों ही महाकाव्यों में सङ्.गीत के तत्व गायन, वादन एवं नृत्य के अनेक अंश व्याप्त हैं, जो तत्कालीन समय के समाज का सङ्.गीत प्रेम–अनुराग, सङ्.गीत–ज्ञान इत्यादि के साथ महाकवि की प्रतिभा का द्योतक भी है। सङ्.गीत के तत्व गायन, वादन तथा नर्तन में से वादन के विशिष्ट तत्वों का अध्ययन कर तत वाद्य का समावेश इस लेख में किया जा रहा है।

प्रस्तावना

संस्कृत वाङ्.गमय में अनेक कवि, महाकवि एवं विद्वान हुए, जिनकी काव्य प्रतिभा सम्पूर्ण विश्व में प्रसरित हुआ। उनकी प्रतिभा से संस्कृत की बगिया में अनेक फूल खिले, जो विश्व के कोने–कोने को सुवासित किया। इस साहित्य के महाकवि एवं विद्वानों में कालिदास, भारवि, माघ, श्रीहर्ष, भवभूति, वाणभट्ट, शूद्रक, सुबन्धु, दण्डी, भामह, भास इत्यादि प्रमुख है, जिन्हे संस्कृत काव्य धारा के अनुरागी कभी विस्मृत नही कर सकता। संस्कृत साहित्य के विद्वानों में अप्रतीम प्रतिभा रही है। जिसके कारण लोक में उन्हे अनेक उपाधि मिली। जैसा कि महाकवि कालिदास को उपमा के लिए, भारवि को अर्थगौरव के लिए एवं दण्डी को पदलालित्य के लिए सर्वोपरि कहा गया है।[1]

कालिदास अपनी प्रतिभा से केवल भारत में ही नही अपितु सम्पूर्ण विश्व में कीर्तिमान हुए। महाकवि कालिदास कवियों में शिरोमणि थे। इसी कारण इन्हे 'कुलगुरू' से सम्बोधित कर आदर दिया गया। कालिदास विरचित दो महाकाव्य 'रघुवंशम्' और 'कुमारसंभवम्' विश्वप्रसिद्ध हैं। जिनमें अनेक शोध हो जाने पर भी शोधाध्ययन के योग्य हैं, जिससे शोध जगत एवं साहित्य प्रेमियों को नूतन तथ्य मिल सके। आधुनिक समय में प्राच्य सभ्यता, संस्कृति, सामाजिक रूचि–अभिरूचि एवं सङ्.गीत के तत्व गायन, वादन के प्रचलन इत्यादि के दृष्टिकोण से महाकाव्यों का अध्ययन आवश्यक है।

उद्देश्य

प्रस्तुत अध्ययन का मुख्य उद्देश्य संस्कृत के महाकाव्यों में निहीत सङ्.गीत के तत्वों को स्पष्ट करना है, सङ्.गीत में प्रयुक्त होने वाले वाद्यादि का तत् समय प्रचलन कैसा था तथा किन–किन वाद्य यंत्रों का प्रयोग अवसर अनुरूप किया

शोधच्छात्र डॉ. सी.व्ही.रामन वि.वि. करगी रोड, कोटा, बिलासपुर

जाता रहा है। ताकि सङ्.गीत एवं संस्कृत साहित्य का अध्ययन–अध्यापन करने वाले मनीषियों को इसका लाभ मिल सके एवं साहित्यों में अंकित वाद्यादि साङ्.गीतिक तत्वों को वर्तमान के परिपेक्ष्य से जोड़ा जा सके। वर्तमान में सृजित होने वाले काव्यों पर प्राच्य महाकाव्यादि की छाया प्रतिबिम्बित होवे।

इस शोधपत्र का विषय कालिदास के महाकाव्यों में विद्यमान तत वाद्यों का अध्ययन है। तत वाद्यों को तन्त्री वाद्य भी कहते हैं। भरतमुनि ने तत वाद्य के लिए **''ततं तन्त्रीकृतं ज्ञेयम्''**[2] कहा है। तात्पर्य यह है कि तन्त्री निर्मित वाद्य को तत वाद्य जानना चाहिए। प्राचीन समय में प्रसिद्ध तंत्री वाद्यों में **वीणा, अलावणी, लघुकिन्नरी, वृहत्किन्नरी, शकनी इत्यादि हैं।**[3]किन्तु वर्तमान समय में प्रसिद्ध तन्त्री वाद्य सरोद, सितार, सारंगी, वायलिन, तानपूरा, तम्बूरा, एकतारा इत्यादि हैं।

आचार्यो के मत से यह स्पष्ट है कि तार अथवा तंतु से बजने वाले वाद्य तत (तन्त्री) होते हैं। अतः कहा जा सकता है कि ऐसे वाद्य जिनमें स्वरोत्पत्ति

शोध का विषय

इस शोधपत्र का विषय कालिदास के महाकाव्यों में विद्यमान तत वाद्यों का अध्ययन है। तत वाद्यों को तन्त्री वाद्य भी कहते हैं। भरतमुनि ने तत वाद्य के लिए **''ततं तन्त्रीकृतं ज्ञेयम्''**[2] कहा है। तात्पर्य यह है कि तन्त्री निर्मित वाद्य को तत वाद्य जानना चाहिए। प्राचीन समय में प्रसिद्ध तंत्री वाद्यों में **वीणा, अलावणी, लघुकिन्नरी, वृहत्किन्नरी, शकनी इत्यादि हैं।**[3]किन्तु वर्तमान समय में प्रसिद्ध तन्त्री वाद्य सरोद, सितार, सारंगी, वायलिन, तानपूरा, तम्बूरा, एकतारा इत्यादि हैं।

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विवेच्य महाकाव्य द्वय 'रघुवंशम्' एवं 'कुमारसंभवम्' में से रघुवंशम् महाकाव्य में महाराज अज और रानी इन्दुमती के नन्दन वन में विहार और उसी क्षण आकाश मार्ग पर नारद का गमन वर्णित है। जहाँ तत वाद्य परिलक्षित होता है।

अथ रोधसि दक्षिणोदधेः श्रितगोकर्ण निकेतमीश्वरम्।
उपवीणयितुं ययौ रवेरूदयावृति पथेन नारदः ।।[4]

अर्थात्–इसके पश्चात् दक्षिण समुद्र तट पर 'गोकर्ण' नामक स्थल पर स्तुति करने के लिए शिव जी के समीप नारद वीणा बजाकर आकाश मार्ग से गमन करने लगे। यहाँ पर नारद द्वारा वीणा–वादन वर्णित है, नारद देवऋषि थे जो वीणा वाद्य को हमेशा साथ रखकर चलते थे और अपना निवेदन ईश्वर से करते समय उसका वादन किया करते थे। अतः उन्होने वीणा का वादन किया। वीणा तन्तु अथवा तार से बजने वाला वाद्य है जो कि तत वाद्य कहलाता है। इसी प्रसंग में कालिदास पुनः लिखते हैं–**''कुसुमैर्ग्रथितामपार्थिवैः स्त्रजमातोद्यशिरोनिवेशिताम्।''** [5] अर्थात् नारद के आकाश मार्ग पर गमन करने पर उनकी वीणा के ऊपरी भाग पर लपेटी गई पुष्पमाला को वायु ने स्वयं को सुगन्धित करने के लिए हरण कर लिया।

यहाँ पर नारद की वीणा को 'आतोद्य' की संज्ञा प्राप्त हुयी है। किन्तु आतोद्य का पर्याय वाद्य है और नारद का वाद्य केवल वीणा ही प्राप्त होता है। अतः यहाँ आतोद्य का तात्पर्य वीणा से है, जो तंत्री वादय है। पुनः नारद के वीणा के ही सम्बंध में पद्य प्राप्त है–

भ्रमरैः कुसुमानुसारिभिः परिकीर्णा परिवादिनी मुनेः।
ददृशे पवनाव लेपजं सृजती वाष्पभिवाञ्जनाविलम्।।[6]

अर्थात्– भ्रमर समूह का पुष्पों के अनुगमन करने पर नारद की वीणा वायु द्वारा अपमानित होकर अञ्जन से मलिन आँसुओं को छोड़ती हुई के समान दिखाई देने लगी। यहाँ कवि की कल्पना अनुपम है। कालिदास ने नारद की वीणा का स्पष्ट नामोल्लेख 'परिवादिनी' किया है। किन्तु सांसारिक व्यवहार को देखें तो परिवादिनी का तात्पर्य 'ऐसी स्त्री जो आक्रोशित होकर खरी खोटी सुनाए' भी होता है। कालिदास ने यहाँ पर लोक जीवन को भी इंगित किया है। संगीत शास्त्रकारों के अनुसार परिवादिनी वीणा का उल्लेख सर्वप्रथम इसी (रघुवंशम्) महाकाव्य में ही हुआ है। परिवादिनी वीणा के सम्बन्ध में कहा गया है–

''सप्तभिः तन्त्रिभिः दृश्यते परिवादिनी।''[7]

अर्थात्– परिवादिनी वीणा सात तारों (तन्तु) से युक्त होती है। राजा अज की प्रिया इन्दुमती के अवसान वर्णन पर भी वीणा वाद्य वर्णित है–

''प्रतियोजयितव्य वल्लकीसमवस्थामथ सत्वविप्लवात्।''[8]

अर्थात्– अज तार चढ़ाये जाने योग्य वीणा स्वरूप स्वपत्नी इन्दुमती को गोद में ले लिया।

यहाँ भी तत वाद्य वीणा का भेद 'वल्लकी' का उल्लेख हुआ है। वल्लकी के संबंध में विद्वान कहते हैं– '**वल्लते स्वरान इति वल्लकी**' जो स्वरों को नियंत्रित करे, उसे वल्लकी कहते हैं। अमर कोश में वीणा के तीन प्रकार कहे गये हैं–नाना वीणा, वल्लकी और विपञ्ची।

वल्लकी वीणा का उल्लेख रामायण एवं महाभारत में भी मिलता है। यथा–

क्लिष्टरूपामसंस्पर्याद युक्तामिव वल्लकीम्।[9]
वीणानां वल्लकीनां च नुपूराणां चशिंजितैः।[10]

इस प्रकार यह स्पष्ट है कि 'वल्लकी' वीणा का ही भेद है।

भरत का गन्धर्वों पर विजय वर्णन में भी तत वाद्य का उल्लेख अवलोकनीय हैं–

भरतस्तत्र गन्धर्वान्युधि निर्जित्य केवलम्।
आतोद्यं ग्राहयामास समत्याजयदायुधम्।।[11]

अर्थात्– भरत ने गन्धर्वों को युद्ध में पराजित कर केवल वीणा को धारण करने योग्य बना दिया और शंख धारण करना छुड़ा दिया।

यहाँ पुनः 'आतोद्य' संज्ञा वीणा के लिए प्रयुक्त हुआ है। गन्धर्व जनों को स्वर्ग लोक का गायक कहते हैं। ऐसी किवदन्तियाँ हैं कि गन्धर्व देवताओं के गायक थे, जो वीणा वाद्य धारण कर देवताओं का यशोगान किया करते थे। भरत ने उन्हे पुनः उसी कार्य में नियोजित किया। तन्त्री वाद्य का उल्लेख राजा अग्विनर्ण के विलासिता वर्णन में भी द्रष्टव्य है–

''**वल्लकी च हृदयङ्.गमस्वनावल्गुवागपि च वामलोचना।** ''[12]

अर्थात्–अग्निवर्ण के दोनों पार्श्वों में एक ओर वीणा और दूसरी ओर सुलोचनाएँ रहा करती थीं, जिससे उनके पार्श्व हमेशा अशून्य रहता था।

यहाँ भी 'वल्लकी' का उल्लेख हुआ है, जो वीणा का भेद है। जिसे कालिदास ने अग्निवर्ण के एक पार्श्व का हिस्सा बतलाया है। उनके इस वर्णन से स्पष्ट है कि अग्निवर्ण विलासी होने के कारण अत्यधिक काम वासनाओं में संलिप्त न हों, अतः वल्लकी उसे भी नियंत्रित करे। यह भाव अभिव्यंजित होता है।

कुमारसंभव महाकाव्य में तत वाद्य का स्पष्ट उल्लेख नही हुआ है। एक स्थान पर सांकेतिक रूप में वीणावादक परिलक्षित है–

'' **विश्वासुप्राग्रहरैः प्रवीणैः संगीयमानत्रिपुरानदानः।**''[13]

अर्थात्–विश्वासु आदि गन्धर्व निपुण वीणा वादक जिनके त्रिपुर विजय का यशोगान कर रहे थे। इस प्रकार कालिदास के रघुवंशम् एवं कुमारसंभवम् महाकाव्यों में तत वाद्य का अवलोकन पूर्ण होता है। इन्हीं स्थानों में ही तत वाद्य के अंग वीणा प्राप्त होता है, अन्यत्र नही।

निष्कर्ष

प्रस्तुत शोध पत्र का निष्कर्ष यह निकलता है कि संस्कृत साहित्य के महाकाव्यों में सङ्.गीत के तत्व साङ्.गीतिक वाद्य यंत्रों का उल्लेख तत्कालीन समय के अनुसार किया गया है। प्राचीन समय में प्रचलित वाद्य यंत्र वर्तमान के वाद्य यंत्रों का मूल रूप रहा है। वर्तमान समय में प्रचलित वायलिन, सरोद, सितार इत्यादि वाद्य यंत्रों का निर्माण प्राक् वीणा के प्रकारों के आधार पर हुआ होगा, यह भी अभिव्यक्त होता है।

कालिदास के इन महाकाव्यों के अध्ययन से ईसा के पूर्व से लेकर छठवीं शताब्दी तक के समाज में व्याप्त सङ्.गीत का परिदृश्य आलोकित होता है। उस समय सङ्.गीत का स्थान वर्तमान समाज में सङ्.गीत से कम नही था, क्योकि कालिदास के इन काव्यों में अनेक अवसर पर सङ्.गीत का आयोजन दिख पड़ता है। चाहे घर में बच्चे का जन्मावसर हो अथवा किसी की मृत्यु। गन्धर्व आदि के द्वारा राजा के युद्ध अवसर पर, कामक्रीड़ा आदि के अवसर पर महाकवि ने सङ्.गीत को समायोजित किया है।कालिदास के महाकाव्य साङ्.गीतिक, सामाजिक, दार्शनिक, राजनैतिक, साँस्कृतिक इत्यादि को समझने का कोश प्रतीत होता है, इनके काव्य मानव हृदय को भाव से भरने के लिए सागर–तुल्य है, जो कवि के अप्रतिम प्रतिभा का परिचायक है।

संदर्भावली–

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