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CONTENTS

1 Two Decades of Zilla Parishad Elections in Maharashtra: A Data Based Close Look at the Inferences (1994-2013)

Dr. Dnyandev Talule[1] and Dr. Rajas Parchure [2]

ABSTRACT :

Post 73rd and 74th Constitutional Amendments of 1992, the State Election Commission of Maharashtra was set up in 1994. Since then it conducts the elections to the local bodies including Zilla Parishads, Panchayat Samitis and village Gram Panchayats for rural democratic setup and the elections to the Municipal Councils and Corporations in urban power structure. Elections to Zilla Parishad and Panchayat Samitis are conducted simultaneously while for Corporations and Councils the elections take place at the regular interval of every five years. Since its inception in 1994 the State Election Commission of Maharashtra has been electing approximately 2.5 lakh "people representatives" in nearly 28,000 local bodies which comprise 26 Municipal Corporations, 340 Municipal Councils and Nagar Panchayats, 34 Zilla Parishads, 351 Panchayat Samitis and approximately 27, 781 Gram Panchayats respectively (J. Saharia, 2016). The paper attempts to summarize and analyze the past data of Zilla Parishad elections in Maharashtra to bring out important insights into the behavior of several variables. This not only helps in understanding the patterns in key electoral variables better, but also has immense value in terms of planning relevant policies for the upcoming Zilla Parishad elections. The study creates numerous insights pertaining to voter turnout, political alignment, competition amongst political parties, dynamics of reservation of seats for SC, ST and BCC candidates, dynamics of seats won by independent candidates etc. While this analysis is definitely relevant for

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1. The present paper is based on one of the State Election Commission studies conducted at the Gokhale Institute of Politics and Economics, Pune. The study on which the present paper is based was funded by the State Election Commission of Maharashtra.
2. The State Election Commission Study on Zilla Parishad Elections in Maharashtra from 1994 to 2013 on which the present paper is based was conducted together by Professor Rajas Parchure, Manasi Phadke and Professor Dnyandev Talule.

posterity, it aims to fill in the gaps of information so that the State Election Commission of Maharashtra is aided in crafting electoral policies.

KEYWORDS : Zilla Parishad, Electrics, Election Commission

1. INTRODUCTION:

The roots of local governance in ancient India date back to the period of *Rig-Veda* (1700 BC). However, local governance in contemporary India owes its genesis to the establishment of various Municipal Corporations / Zilla Parishads in the country during the British era. A Zilla Parishad, in a federal state like India, is an administering local body that oversees the development of an entire district. Zilla Parishad is a body created to oversee the governance and developmental aspects of the entire district which may comprise an equally large number of Panchayat Samitis. Village development through Taluk Panchayat Samitis is facilitated by the Zilla Parishad. The first major attempt to institutionalize the Panchayats came from the Report of Balwantrai Mehta Committee which was mainly set up to assess the performance of community development Programmes. The Committee advocated democratic decentralization and recommended the constitution of a three tier structure of Panchayats with Gram Panchayat at the village level, Panchayat Samitis at the block level and Zilla Parishad at the district level (GoI 1957).This was further bolstered by the government enthusiastically adopting the proposal for the three-tier Panchayat system in rural India, and re-christened it as Panchayati Raj. By 1959 almost all States in the country had passed Panchayati Raj Acts and by the mid-1960s most of the States, including Maharashtra which emerged in the forefront to implement the proposal, had in place the three tier Panchayati Raj system.

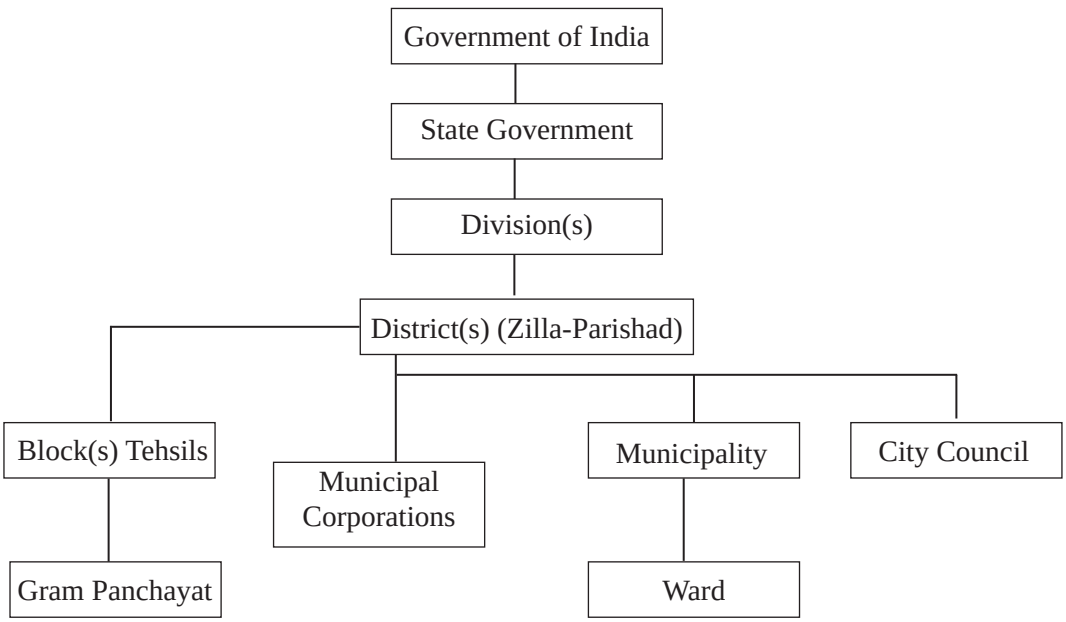
The purpose of Zilla Parishad governance and strategic rural planning in a country is to create effective, responsive, democratic and accountable local government framework for about 6.2 lakh villages spread across the nation. Both in India and abroad democracy and decentralization take the place of preponderance in local governance. The idea of local governance continues to quietly sweep the world. From Bolivia to Bulgaria and from West Africa to South Asia, several countries have been strengthening their local governments and working to make them more responsive and effective (USAID 2000). Decentralization promotes democracy in myriad ways. Decentralization brings government closer to citizens and allows people to participate more effectively in local issues concerning development by identifying community priorities (Ibid). This also facilitates the gain of democratic experience of people and elected representatives. Therefore, for the last twenty five years, the concept of 'participation' has been widely used in the development discourse. Democratic governance implies participation in the

process of formulation, passage and implementation of public policies (Perry Mosley and Day, 1992). Local elections provide citizens with an opportunity to vote in or vote out parties from power, thereby making local bodies vibrant and democracy, stronger.

Administrative Structure and Decentralization of Power at Zilla Parishad:

The Chief Executive Officer (CEO) of Zilla Parishad, who is an IAS officer, heads the administrative machinery. He may also be the district magistrate in some states. The CEO supervises the divisions of the Parishad and executes its development schemes. The pattern of administration can be understood from the following diagram.

73rd and 74th Amendements-1992



Elections to Zilla Parishad:

Democratic pattern of governance and elections are by no means new to the modern world. In ancient Greece and Rome, and throughout the medieval period, rulers such as the Holy Roman Emperor and the Pope were elected (Encyclopedia Britannica). Elections have been the fulcrum of modern democracy since the 17th century. Like the parliamentary elections in India, elections to local bodies such as Zilla Parishad are also held every five years. Very often the ruling party or local alliance elected to power at the

local district, Taluk or panchayat level is in alignment with the party or combine ruling at the State level even though in Zilla Parishad and Panchayat Samiti elections local issues are likely to be more dominant than the party philosophy or policies and programmes that the party may adopt at the broader State level.

Theoretical Perspective and the Global Experience of Voter Turnout at Local Body Elections:

Low voter turnout in elections is not the concern of Indian democracy alone. Even American democracy has repeatedly experienced the concern of low voter participation in federal elections (Bannett and Resnick, 1990, Sidney Verba, Schlozman and Brady 1995). Almost half of the eligible voters of the US do not exercise their franchise in presidential elections, which can broadly be termed as an "evidence of crises in country's democracy" (Ruy A. Texeira, 1992, Rosenstone and Hansen, 1993). In recent decades, a few studies have attempted to look comprehensively at Municipal level voter turnout in the US. These studies suggest that voter turnout in Municipal elections may average half that of national elections, with turnout in some cities falling below a quarter of the voting age population (Alford and Lee, 1968), (R. L .Morlan, 1984 and Ruby Bridges, 1997). However, the voter turnout at elections to rural local bodies like Zilla Parishads in different states of India is often observed to be higher than the turnout at parliamentary elections. Low voter turnout in Municipal elections raises a number of concerns, the most serious being that the voice of the people in Municipal elections is likely to be severely distorted. Disadvantaged segments of the society, racial and ethnic minorities, the poor, illiterates tend to vote significantly less regularly than others in democratic contests (Rosenstone and Hansen, 1993) and (Sidney Verba, Schlozman and Brady 1995). And therefore, with low voter turnout, this bias is likely to become more pronounced (Wattenberg, 1998).

At the local level then, there is a risk that non-participation in the democratic process and consequent low voter turnout may actually distort people's representation. Therefore, increase in turnout in local urban or rural elections is a challenge for strengthening democracy and designing and implementing people-oriented policies and Programmes at the local level. Voting in local elections in fact provides citizens with an opportunity to learn about and engage in a democratic process beginning with the grassroots level. Given the proximity of the local government and its relatively small size, it is in many ways easier for citizens to acquire crucial democratic skills and become familiar with the public realm at the local level (Zoltan Hajnal P. G. Lewis and Hugh Louch, 2002). Election timing is also observed as a vital determinant of voter turnout which matters the most. This is because voter turnout is observed to be much lower in off-cycle than in on-cycle elections. Looking at California, for example, it was found that average voter

turnout in an off-cycle election is 35 per cent lower than turnout when city elections are held at the same time as presidential elections (Sarah F. Anzia 2014).

"Social capital" is believed to play a dominant role in increasing voter turnout, which in turn improves political representation both at the national and local levels of governance (Mathew D. Atkinson and Anthony Fowler, 2012). Voting requires time and information and there is little chance that one vote will change the election outcome; hence the turnout poses a classic collective action problem (Mancur Olson, 1965). It is argued that social capital may provide a solution to the collective action problem of voter turnout which is defined as "Citizen Engagement in community Affairs" (Robert Putnam, 1995, P.664). Social capital can increase voter turnout by increasing the flow of political information through a community. Recent field experiences demonstrate that societal pressure could lead to an increase in voter turnout to the extent of 30 to 38 per cent (Gerber et al, 2008). However, a contrary view points out that social connectedness may actually lead to decrease in voter turnout in cases where an individual social network creates a force which does not rely on voting to make its voice heard. (Diana C. Mutz, 2002). Also an increase in social capital in heterogeneous communities leads to uncertainty about political views and reduces the voter turnout (Ibid). In a nutshell, there are good reasons to believe that social capital may have positive or negative effects on voter turnout at every level of democracy, irrespective of rural or urban.

Voter turnout, which refers to the percentage of voters who exercise their franchise at an election, out of the total number of eligible voters, is one significant measure of citizen participation in democratic politics. Worldwide, voter turnout during the period 1945–2001 shows a notable decline, with major decline taking place since the mid-1980s (Rafael Lopez Pintor, 2002, Maria Gratschew and Kate Sullivan, 2002). Africa witnessed a pronounced increase in democratic participation during the 1980s when several African nations were riding the wave of democratization. Turnout in North and South American countries during the same period was observed to be stable, as was that of Oceania and Western Europe. During the same period, the Middle East recorded varied turnout while Asia witnessed the most pronounced variations in democratic participation (Ibid). Average turnout from 1990 to 2001 peaked at 79per cent in Oceania which was just ahead of Western Europe with turnout proportion of 78 per cent. Both Asia and Central and Eastern European region for the same period had an average voter turnout of 72 per cent while the average in Central and South America was 69 per cent, North America and the Caribbean – 65 per cent. Africa's average turnout was the lowest at 64 per cent which, by all standards, is higher than the voter turnout at most of India's Parliamentary elections (Ibid). The comparison of voter turnout across nations further elucidates a wide

range of variations. For example 93 per cent voter turnout in a country like Liechtenstein in Western Europe against 56 per cent in neighboring Switzerland can be attributed to compulsory voting in Liechtenstein. On the contrary, a country like Bahamas where voting is not compulsory, records a turnout of 92 per cent compared with the Haitian average of 47 per cent (Ibid). Since the 1970s established democracies of the world have recorded a slow but steady decline in voter turnout; however during the same period, several other nations where participative democratic processes strengthened, recorded vast increase in turnout, peaking at about 80 per cent (Ibid). There is no doubt that the capacity to read and write, female literacy ratio (FLR), Per Capita Income (PCI), etc. do not necessarily translate into an ability to make coherent and informed political decisions. In fact, it is observed that while voter turnout does increase initially with increase in literacy, it tends to decline in societies where literacy exceeds 90 per cent (Ibid).

There are 9 major electoral systems within parliamentary elections used around the world. Alternative vote used in Australia, Fiji and Nauru demonstrate an average turnout of 91 per cent while Jordan and Vanuatu with single non-transferable vote system have an average turnout of 43 per cent. The other systems do not have such a large deviation, with single transferable vote at 80 per cent and two round system at 63 per cent. An interesting result is the relatively small difference between the two most widely used systems. Very often the reason cited for low voter turnout is that for many people today democracy has become synonymous with elections and political parties; other than voting once every five years, ordinary citizens are more likely to remain detached from the issues of governance. It is a fact that voter participation has decreased and the established democracies of the world have experienced what is termed as crises of political parties.

The United Nations General Assembly Convention 1979 which seeks to eliminate all forms of discrimination against women also emphasizes the importance of equal participation of women in public life. However, the question remains as to whether women participation in the overall voter turnout has actually increased. Various studies on voting pattern in Western Europe and North America establish the fact that gender, along with age, education and social class, was one of the standard demographic and social characteristics used to predict levels of civic engagement, political activism and electoral turnout (Tingsten, 1937, Almond and Verba, 1963, Stein Rokkan, 1970, Verba Sidney N, and Norman H. Nie, 1972).The studies also reveal that gender differences were narrowing even in the 1950s in advanced industrialized societies such as the Sweden (Martin Lipset, 1960). In most societies, when it comes to political activity, men are found to be more active than women (Verba, Sidney N, Nie Lekajcie Sieand Kim Cattreal 1978). Such gender differences have persisted in spite of significant advances in

the levels of education usually, women are found to be less involved in unconventional forms of democratic participation such as strikes and protest movements, thereby leading to lower participation of women also in conventional democratic processes (Barnes and Kaase, 1979). However, this finding has been visibly challenged by the female voting pattern in recent times. In the US for example, in the Presidential elections held post 1980, the proportion of eligible female adults who exercised their franchise exceeded the proportion of eligible male adults. The same phenomenon was evident in non-presidential mid-term elections since 1986 (CAWP, 2000). Overall percentage of female voter turnout in the US outnumbers the male electorate implying that the number of female voters has exceeded the number of male voters in every Presidential election. Similar trends are evident in Britain where the gender gap in turnout reversed in 1979 so that by 1997 elections an estimated 17.79 million women voted compared with about 15.8 million men (Rafael Lopez Pintor, Maria Gratschew and Kate Sullivan, 2002). This indicates that the patterns of voter turnout can be influenced by a legal framework that draws citizens towards meaningful political activity (Ibid). In nations like Barbados and Sweden it is observed that the number of female voters consistently exceeds male voters. Conscious attempts to bring women into political framework can potentially lead to increase in the voter turnout.

Other important factors that may influence voter turnout include the proportion of youth voters to total voters, internet voting, extended polling, and perhaps even compulsory voting. Compulsory voting is not a new idea; countries like Belgium (1892), Argentina (1914) and Australia (1924) were among the first countries to introduce compulsory voting laws (Ibid).

Zilla Parishad Voter Turnout in India

Even though the State of Maharashtra is not an exception to low voter turnout at Municipal Corporation elections, the voting behaviour at its closest rural counterpart, i.e., the Zilla Parishad elections is always observed to be higher. The voter turnout at Municipal elections in the State is observed to be lower while the same for Gram Panchayats, Block Panchayat Samitis and Zilla Parishads has been higher. Elections to the Municipal Councils and Municipal Corporations in Maharashtra have recorded a voter turnout of less than 45 per cent; even larger city corporations like Mumbai and Thane have not been an exception (ToI, 2012). This is an evidence of low engagement of citizens in community affairs (Olson Mancur, 1965). With this background, the voter turnout at the elections to the Zilla Parishads and Block Panchayat Samitis presents a far better picture of citizen participation. A large number of districts have recorded voter turnout of 70 per cent at Zilla Parishad elections and in many districts it was between 75

and 80 per cent (The Pioneer, 2016). This phenomenon can be observed across States in India. In Andhra Pradesh the voter turnout at Zilla Parishad elections is often higher than 80 to 85 per cent (Business Standard, 2014), whereas in Mysore it was 75.65 per cent (Deccan Herald, 2016). In Dakshina Kannada Zilla Parishad 69 per cent voter turnout was recorded (Coastaldigest.com) while other parts of Karnataka such as Sullia, Puttur, Bantwal, Mangaluru and Belthangady have recorded a voter turnout of 74.15, 71.40, 69.48, 65.58 and 64.82 per cent respectively (Ibid).

Though voter turnout in elections to Zilla Parishads in Maharashtra is substantially higher than the turnout at Municipal elections, there is still scope for further increase in the voter turnout. Voter turnout at local elections in Maharashtra poses a classic collective action problem. Only high voter turnout can ensure a truly participative democracy and serve the larger public interest by designing policies and Programmes that are in sync with public aspirations. In order to formulate policies to increase voter turnout, it is important to analyze the data of preceding elections to understand the trends in voter turnout. Once the trends are understood, it would be possible to target certain areas more intensively for increasing the voter turnout in such areas. It is with this objective that the study of election data analysis on Zilla Parishad elections held between 1994 and 2003 was commissioned to Gokhale Institute of Politics and Economics, Pune at the initiative of the State Election Commission of Maharashtra.

II. DATA AND METHODOLOGY :

As the present paper is mainly based on the four rounds of Zilla Parishad elections in Maharashtra, the data pertaining to these elections is obtained from the State Election Commission records. The data available with the State Election Commission of Maharashtra (henceforth SECM) across four rounds of elections on which the present paper is based, referred to as R1, R2, R3 and R4 hereafter are of different types. The SECM data sets that are used for our analysis pertain to; the proportion of votes to different political parties and the seats won by these political parties. Besides this the data also pertained to the number of voters actually exercised their voting right, voter turnout in general and voter turnout by gender in particular. For all these four rounds of elections the data on number of wards, number of seats for the general category contestants and the seats contested by the SC, ST and BCC candidates and the seats reserved for women candidates across all categories are used for the analysis. For some of the local bodies, data on Voter Turnout is missing for R1. But, data on all variables is definitely available for R2, R3 and R4. This data is available for Municipal Corporations, Municipal Councils, Nagar *Pachayats,* Zilla *Parishads* and Panchayat *Samitis.* Out of the data available for all the different local bodies, this paper is purely based on the analysis of data pertaining to Zilla Parishad.

III. DISCUSSION AND ANALYSIS :

i. Behaviour of Main Variables across Different Rounds of Elections:

Zilla Parishad and Panchayat Samiti elections are held at the same time. Thus, every voter casts two votes on the day of elections, one for the Zilla Parishad representative, and one for the Panchayat Samiti (referred to as ZP and PS respectively hereafter) representative. Thus, the voter turnout rate for ZP and PS is identical. However, trends in other variables such as distribution of reserved category seats in the local body, political alignment of the local bodies, proportion of seats won by independent candidates, etc. could be different in Zilla Parishads and Panchayat Samitis.

Voter Turnout is a crucial variable for the SECM. A higher VT is a policy objective, and indicates that the democratic forces are indeed operative at the grassroots level. A higher VT truly invokes higher competition amongst political parties and independent candidates alike. Following are the summary statistics for VT across four rounds of ZP Elections.

Table 1: Trends in VT across Successive Rounds of Elections

VT	R1	R2	R3	R4
Mean	70.162	69.438	69.236	67.54
Std. Deviation	5.895	5.032	4.429	3.81
Minimum	56.910	56.422	59.300	58.24
Maximum	79.730	79.148	78.600	75.37

There are three worrisome observations about the voter turnout at ZP elections. The overall VT average across all rounds of elections stands at 69.09 per cent. As has been mentioned in the foregoing, ZP and PS elections are held simultaneously. Hence, the average VT for both ZP as well as PS elections is 69.09 per cent. The average voter turnout for Municipal Corporation elections in Maharashtra is 56 per cent whereas that for Municipal Councils and Nagar Panchayats is 71 per cent. It is worrisome to note that the VT in ZP and PS elections is lower as compared to the VT in Municipal Council and Nagar Panchayat elections. This implies that a higher proportion of the population votes at the Municipal Councils and Nagar Panchayats, which govern small urban or sub-urban areas, as compared to the proportion of population which votes for ZPs and PSs, which govern the rural parts of districts and blocks respectively.

This is truly surprising because it has been a common observation across countries, states and local areas that rural areas have higher VT as compared to urban areas. This is because the urban voter does not exclusively rely on his vote to voice his opinion. He

uses social media, newspapers, citizen groups and NGOs to voice his opinion on social issues. However, these options are not available to the rural voter or to the urban voter in small townships. Hence, one would normally expect the average VT to increase as one moves from Municipal Corporations to Municipal Councils and from Councils to ZPs. The average VT for Municipal Corporations in Maharashtra stands at 56.31 per cent while for ZP and PS it stands at 69.09 per cent and for Municipal Councils and Nagar Panchayats it stands at 70.77 per cent. Data trends belie intuition. Thus, the average VT in ZP and PS elections has in fact been lower than that in the Municipal Council elections. One of the reasons that could be a contributing factor to this trend could be migration. If the level of migration from rural to urban areas is higher as compared to that from semi-urban areas to urban areas, then it may reflect in lower VT in the rural body elections. This trend also highlights the fact that urbanization and migration could well become a central policy issue for the SECM over a period of time. More thought will have to be given to how migrating voters may be allowed to cast their vote from distant locations.

The second worrisome observation is that the voter turnout has been continually falling over the four rounds of elections held so far. In the Municipal Council as well as Municipal Corporation elections, the voter turnout has increased in R3 i.e. in the elections held during the period 2004-08. However, in the ZP election data, there is almost a linear decrease in the voter turnout with every election. Clearly, the enthusiasm in the urban voters in R3 has not been observed in rural voters.

There is a rather interesting, but again worrisome story in the variability of the VT. A look at the standard deviations tells us that the standard deviations in the VT are falling across successive rounds of elections. The standard deviation is a measure of variability. It tells us how much variability is there in the data pertaining to VT in different rounds of elections. A reduction in the standard deviation tells us that even though the average VT has been falling, it does seem to be the case that the diversity in the voting patterns across various ZPs is reducing. Thus, in R1, there may be ZPs with extremely high and/or low values; however these extremities are getting replaced by a more uniform pattern of voting across successive rounds of elections. A lower standard deviation and a lower average implies that from R1 to R4, lesser number of voters are casting their votes and this is becoming a more uniform trend across all ZPs. An increasing average with a lower standard deviation is desirable; but a lower VT with more uniformity indicates a rather discouraging trend.

The same point comes across more clearly when one considers the behaviour of the minimum and maximum numbers in different rounds of elections. The minimum VT has increased across time and the maximum has reduced across time; these two put

together imply that the standard deviation or variability in data will reduce. However, the increment in minimum is lower as compared to the reduction in maximum; this causes the average VT to fall across successive rounds of election.

Are there certain ZPs which repeatedly show higher or lower VT numbers? The following explanation shows which ZPs belong to the high VT cluster and which belong to the low VT cluster in every round of elections. There are 5 divisions which repeatedly occur in the high VT cluster, namely Aurangabad, Amravati, Chandrapur, Pune and Konkan. None of the districts in Nasik division show very high VTs. Now, one can easily see how the trends in VT have changed across time. Districts in Amravati division only exhibit high VTs in R2. It is interesting to note that all three districts namely Akola, Washim and Buldhana score extremely low on the development index variable (DEV) as shown in the paper later. In Aurangabad division, the epicentre of high VTs has moved gently from Parbhani to Hingoli. Again, Parbhani and Hingoli show very low development levels.

Chandrapur and Pune divisions are special because districts in these divisions have been consistently showing high VTs in all 4 rounds of elections. In Chandrapur division, one can see that the epicentre of high VTs has moved from Gadchiroli towards the northern districts of Bhandara and Gondia. In these districts again, development quotients have persistently remained low and hence, these districts may be consistently showing higher VTs. In Pune division too, one finds the epicentre of high VT moving from Sangli towards Kolhapur. However, districts in the Pune division boast of some of the highest development quotients in Maharashtra. Then how is it that Sangli and Kolhapur show such high levels of VT?

High VT could undoubtedly be a reflection of low development however, there are some areas with a "culture" of political activism and voting. Kolhapur district is an area wherein VT is high across all local bodies, i.e., Municipal Corporation of Kolhapur, Municipal Councils and Nagar Panchayats in the Kolhapur District, as well as the Zilla Parishad of Kolhapur. We could thus conclude that Sangli-Kolhapur is that part of Maharashtra wherein the voter is very sensitized to elections and hence, these areas have an interesting and entrenched voting culture and voter awareness.

Only Raigad district in Konkan division shows a high VT in R1. However, one finds that districts in Konkan division get eased out of the high VT cluster in successive rounds of elections. There could be three reasons for this trend. The first could be of course the fact that development has occurred rapidly with Mumbai as an epi-centre of growth and hence, districts in Konkan may not be showing higher VT. Secondly, there is heavy migration from all areas in Konkan to Mumbai; this itself may be contributing to the lower

VT. A third angle to this is that there are 3 districts in Maharashtra which are completely urbanized and hence do not have a ZP at all. These are Mumbai, Mumbai sub-urban and Thane and all these districts occur in the Konkan division. Thus, there could be a cultural issue of contagion wherein urban voters, who exhibit urban apathy, indirectly have a cultural impact on the neighbouring sub-urban, semi-urban and eventually rural areas, contributing to low VT in the division.

Which are those ZPs which historically show low VTs across successive rounds of elections? Re-arrangement of the ZPs shows some interesting patterns. ZPs with poor VTs are either in the Konkan division or in Nasik division. The epi-centres of low VT in Konkan seem to be Thane and Ratnagiri. The rural part of Thane was separated into a different district "Palghar" in 2014 and hence, in the R5 elections, Thane will not have a ZP at all. Ratnagiri needs to be specially considered for launching an aggressive voter awareness campaign.

If the districts of Gadchiroli and Gondia in Nagpur fare poorly on development and exhibit high VT, the districts of Dhule and Nandurbar in Nasik division too fare poorly on development (see the section on DEV), but exhibit low VT. Interestingly, all the four districts have a high ratio of tribal populations and low per capita incomes. And yet, one finds the VT in Nagpur division to be higher than that in Nasik. This again points to the presence of voting culture or political activism culture at certain places in the State. The following table shows the VT trends at a divisional aggregation.

Nagpur, Pune and Aurangabad seem to be the high VT divisions in Maharashtra. But the earlier analysis shows that divisional aggregation may not always be a good idea because any kind of aggregation masks the underlying trends. For example, Pune division shows good VT largely because Kolhapur and Sangli ZPs are included in that division. It does seem to be the case that there are certain districts, rather than certain divisions, wherein voting is steeped in the culture and community living of the place. In such places, higher VT is observed. If this is indeed the case, then a ZP with high VT in one round of elections ought to also exhibit high VT in the earlier rounds. Similarly, a ZP with low VT in one round of elections ought to also exhibit high VT in the earlier rounds. Statistically speaking, this implies that the correlation co-efficient between VT in two successive rounds would be positive. The next section checks for correlation between VT in successive rounds.

ii. Does VT Depend on Past Period VT?

Voter turnout may not only be dependent on the level of propaganda done by candidates, or the amount of hype created during elections or even on expenditure incurred by the Government on voter awareness programs. It could simply be the case that there is a

history or culture of voting associated with certain areas.

Does the VT witnessed in a Zilla Parishad in a particular round show some level of positive correlation with the VT in the past rounds? If yes, then it would imply that ZPs which show high VT continue to show high numbers for the next elections as well. Similarly, the positive correlation coefficient would imply that ZPs with a low ratio continue to exhibit low ratios in the next rounds too. The following table shows the correlation matrix for VT in the different election rounds.

Table 2 : Correlation Matrix for VT

	VT_R1	**VT_R2**	**VT_R3**	**VT_R4**
VT_R1	1.000			
VT_R2	0.697**	1.000		
VT_R3	0.665**	0.541**	1.000	
VT_R4	0.553**	0.471**	0.835**	1.000

** indicate significance at 5 per cent l.o.s.

All correlation co-efficients are positive and significant. This implies that a ZP with a high VT in one round typically tends to exhibit high VT in the next round too. The last row of the table shows the correlation co-efficients of VTs between R4 and the earlier rounds. It shows that the correlation co-efficient between R4 and R3 is 0.835 and that between R4 and R2 is 0.471. This makes intuitive sense and implies that the VT in the current round is more strongly impacted by the VT in the earlier round; this impact however keeps on weakening as we go backward into time.

iii. Cluster Analysis of VT

A cluster analysis is carried out to identify those areas which have exhibited a higher VT and those which have exhibited a lower VT. This analysis is important because it helps to understand where intensive voter awareness programs need to be launched. Thus, the cluster analysis of VT data can become a significant input for a meaningful policy to promote voter awareness. There are certain areas which get classified into a high VT cluster as per the cluster analysis. These areas have a voter turnout of more than 72.32 per cent; the highest VT is in Bhandara ZP in Nagpur division and the lowest in this cluster is in Washim ZP in Amravati division. The average VT for this cluster is 72.67 per cent. Medium level of voter turnout i.e. between 64.95 per cent to 69.35 per cent was witnessed in the areas given below. The maximum value within this cluster i.e. 69.35 per cent VT was seen in Solapur ZP, whereas the minimum VT was seen in Nandurbar ZP. The average level of VT for this cluster stands at 67.43 per cent.

The Zilla Parishads which show the lowest VT ratios are; Thane ZP has the lowest VT at 58.07 per cent. In this cluster, the average VT stands at 61.89 per cent only. Clearly, it is in the ZPs given below that maximum efforts need to be taken to enhance voter turnouts. Thus, the high, medium and low VT clusters have average values of 72.67 per cent, 67.43 per cent and 61.89 per cent respectively. These average values, around which the cluster is arranged, are called as centroids of the cluster. Thus, there are three distinct centroids for the VT cluster process; the high and medium centroids are closer to each other, but the low VT centroid at 61.89 per cent is farther off. It is here that voter awareness programs can make a true difference.

iv. Political Alignment

If a Zilla Parishad has the same party in power as the party in the State Government, political alignment i.e. POL takes value 1, otherwise 0. Political alignment helps to show alignment patterns of ZPs with State Government. The objective of creating this variable is to examine if rural areas of certain districts have a relationship with the government at the State. This variable highlights the effect of a change in the State Governments on local governance tiers. One may well look at it as a "*political trickle down*" effect. Following is a snapshot of how the data looks once POL is constructed.

Table 3: VT and POL in Select Zilla Parishads

Division	Zilla Parishad	VT_ R1	VT_ R2	VT_ R3	VT_ R4	POL _ 1	POL _ 2	POL _ 3	POL _ 4
Amravati	Buldhana	74.74	79.15	71.60	69.68	0	1	1	1
Amravati	Yavatmal	72.84	68.22	67.10	64.72	0	1	1	1
Amravati	Washim	69.09	76.32	73.90	69.98	0	1	1	1
Amravati	Amravati	67.63	65.12	67.00	65.07	0	1	1	1
Amravati	Akola	63.00	73.48	68.50	65.35	0	0	0	0
Aurangabad	Parbhani	79.73	72.78	72.50	71.32	0	0	1	1
Aurangabad	Latur	74.35	73.31	68.70	65.29	0	1	1	1
Aurangabad	Jalna	73.96	71.93	70.60	70.25	0	0	0	0
Aurangabad	Nanded	73.06	72.09	68.10	67.46	0	1	1	1
Aurangabad	Osmanabad	72.34	71.47	69.30	63.47	0	1	1	1
Aurangabad	Aurangabad	67.82	70.77	67.60	68.17	0	0	0	1
Aurangabad	Beed	67.37	68.59	69.10	66.90	0	1	0	1

The various patterns in POL such as 1-0-0-0, 1-1-1-0, 1-0-1-0, 0-1-0-1, 0-1-1-1 etc. are extremely interesting and reveal different political dynamics. If a ZP exhibits a pattern such as 0-1-0-1 or 1-0-1-0, it indicates that there have been a lot of fluctuations in the political alignment. A pattern such as 0-0-1-1 indicates a recent move towards alignment. If an average of political alignment is considered, the average number will obviously lie between 0 and 1. A ZP whose average across all rounds is 0 shows zero alignment to the State Government from 1995 to 2014. A ZP whose average across all rounds is 1 shows maximum influence of State Government over local political forces.

Assume that two Zilla Parishads get an average score of 0.5 which indicates that they've been aligned with the State Government for 2 rounds each. However, the underlying political forces could be very different. One ZP could be showing a pattern of 1-1-0-0 which means that it was aligned with the SS-BJP State Government in R1 and with the INC-NCP State Government in R2, but in the recent two elections, it does not show any alignment with the INC-NCP government. Another ZP may show a pattern of 0-0-1-1 which means that it was not aligned with the SS-BJP Government in R1 and with the INC-NCP State Government in R2, but recently has become aligned with INC-NCP State Government in R3 and R4. Thus, different political equations with the parties in power at State level will create different alignment patterns in POL.

Table 4: Trends in POL in Successive Rounds of Election

	Mean	Std. Deviation	Median	Minimum	Maximum
POL1 (R1?)	.06	.250	.000	0	1
POL2	.73	.452	1.000	0	1
POL3	.76	.435	1.000	0	1
POL4	.79	.415	1.000	0	1

While in R1, only 6 per cent Zilla Parishads are aligned, in R4, 79 per cent of the ZPs are aligned. Clearly, alignment of ZPs with the state government has increased over a period of time. What does this indicate? In the first round of elections for Zilla Parishads, Shiv Sena- BJP was in power at the state level. In this round, it is observed that the political alignment with the State is minimal. However, this increases significantly with successive rounds. When the 2nd, 3rd and 4th round of ZP elections were held, INC-NCP government was in power at the State level. The higher political alignment of ZPs with the State in these rounds implies that the ZPs have been mostly dominated by INC and/ or NCP in Maharashtra.

Further, it is observed that the jump in alignment is very large from R1 to R2. The State Government changed between R1 and R2. If it is true that the INC- NCP combination dominates the Zilla Parishads, then the jump in political alignment gets explained quite well with a change in the State Government. The alignment further shows an increase from R2 to R3 and from R3 to R4, but the increase is very soft. This could be indicative of a saturation effect in terms of the INC-NCP domination at ZP level.

Some Zilla Parishads exhibit complete non-alignment with State incumbent across time. This implies that POL for these states shows a 0-0-0-0 pattern. The State Government does not seem to exercise a hold over local area politics. In these ZPs, there would be other local level forces that really determine the election outcomes. It is to be noted that rural local bodies normally do not enjoy the fiscal autonomy that urban local bodies enjoy, since the taxes and duties which they can collect or the finances they can raise is rather restricted. Thus, rural local bodies depend rather heavily on the State Government for their funding requirements. This automatically implies that the development and performance of a rural local body is a function of its political alignment. Obviously, there are very few ZPs exhibiting zero political alignment; these would make interesting case studies in terms of understanding whether alignment truly impacts the fund flow towards these bodies.

Following is a list of ZPs which show zero alignment with the State in the past 4 rounds of elections.

Table 5: Zilla Parishads Showing Zero Political Alignment with State Government from 1995 to 2014

Zilla Parishad	Division
Akola	Amravati
Jalna	Aurangabad
Ratnagiri	Konkan
Jalgaon	Nasik

Some ZPs exhibit complete alignment with the State Government i.e. the POL in these districts exhibits a 1-1-1-1 pattern. This implies that the State incumbent has a lot of control over local area rural politics in these districts. It is extremely interesting to note that there are no ZPs showing complete alignment with the State incumbent from R1 to R4. The following districts show complete alignment with the State incumbent in all four

rounds of elections. All districts in Pune division are completely aligned with the State incumbent. This shows an interesting contrast viz-a-viz Municipal Councils, wherein Municipal Councils and Nagar Panchayats in Pune division show minimum political alignment with the State Government. Thus, the State incumbent seems to exercise more power over the rural structure i.e. over Zilla Parishads in Pune district, Satara, Sangli, Solapur and Kolhapur, but has not really been effective in terms of influencing local politics at the small town or small city level in Pune.

v. POL and MCC Implementation

There are two patterns in POL across different rounds of election for any Zilla Parishad which are particularly interesting to analyze. One pattern is the 1-0-0-0 and the other is 0-1-1-1. The first pattern indicates that the ZPs were not aligned in R1, but became aligned and stayed so from R2 to R4. Thus, these ZPs were aligned when the SS-BJP Government was in power but were non-aligned when the INC-NCP came to power. One could conclude that these ZPs would be traditional BJP-SS strongholds.

The other pattern is 0-1-1-1. This indicates that the Zilla Parishad was not aligned when the SS-BJP Government was in power but became aligned and remained so once the INC-NCP came to power at the State level. Thus, these could be traditional INC-NCP strongholds. There is only one ZP, which is such that it shows alignment with the State only in R1 and shows no alignment in the other rounds. This is the Ratnagiri ZP. We could conclude that this has been a SS- BJP stronghold. By contrast, there are 20 INC-NCP strongholds, showing alignment only in R2, R3 and R4.

If there is a party stronghold with a low VT, the other party has lower chances of breaking that stronghold. However, if there is high VT in party bastions, the other party would campaign fiercely to break the dominance of the opposite party and hence, such ZPs would be likely to witness strong bitter contests among rival parties. Thus, a combination of a party stronghold together with high VT in a ZP would increase chances of political activism from political parties.

Now, if the high VT cluster is matched with the BJP-SS as well as INC-NCP strongholds, it is possible to understand where the maximum competition will happen. It is in these areas that it is really necessary to put extra effort in terms of implementation of Model Code of Conduct (MCC).

There is only one ZP, namely Ratnagiri which shows a pro-BJP alignment POL pattern of 1-0-0-0. As section 3.1.4 shows, Ratnagiri (with a VT of 62.34 per cent) belongs to

the low VT cluster. Hence, the chances of Ratnagiri showing very high level of political party competition seem to be low in the upcoming R5 elections. The following table shows the list of INC-NCP strongholds together with the VTs in those areas.

Table 6: INC-NCP Strongholds with High VT

District	Division	Average VT	POL R1	POL R2	POL R3	POL R4
Thane	Konkan	58.07	0	1	1	1
Dhule	Nasik	63.36	0	1	1	1
Nasik	Nasik	63.81	0	1	1	1
Nandurbar	Nasik	64.95	0	1	1	1
Amravati	Amravati	66.2	0	1	1	1
Pune	Pune	66.96	0	1	1	1
Ahmednagar	Nasik	67.05	0	1	1	1
Yavatmal	Amravati	68.22	0	1	1	1
Satara	Pune	68.9	0	1	1	1
Osmanabad	Aurangabad	69.14	0	1	1	1
Solapur	Pune	69.35	0	1	1	1
Nanded	Aurangabad	70.18	0	1	1	1
Wardha	Nagpur	70.3	0	1	1	1
Latur	Aurangabad	70.41	0	1	1	1
Sangli	Pune	72.16	0	1	1	1
Chandrapur	Nagpur	72.25	0	1	1	1
Washim	Amravati	72.32	0	1	1	1
Buldhana	Amravati	73.79	0	1	1	1
Gadchiroli	Nagpur	74.27	0	1	1	1
Kolhapur	Pune	75.41	0	1	1	1

In the above table, Zilla Parishads of Wardha, Latur, Sangli, Chandrapur, Washim, Buldhana, Gadchiroli and Kolhapur are completely aligned to the INC-NCP State Government and belong to the high VT cluster; these are likely to be fiercely contested and hence are relevant in terms of paying special attention for MCC implementation.

vi. Competition amongst Political Parties (REVERSE COMP) and Identification of "SWING" Zilla Parishads

REVERSE COMP is a variable that helps to understand the level of competition between different political parties. It is computed as the standard deviation of the distribution of seats won across political parties, coalitions and independent candidates. If the standard deviation is very low, it would be observed that the number of seats is more evenly distributed across different political parties. Thus, lesser the standard deviation, lesser is REVERSECOMP and higher is the level of competition between political parties. In such areas, elections can "swing" the outcome in favour of any one party. Elections of this type can go either way and the areas are classified to be as "swing" areas. Hence, areas with tough political competition between political parties show a high level of swing. Just as the earlier section identifies party strongholds with high VT to be potential areas for fierce political competition, this section identifies swing ZPs where too the contest is likely to be bitter. Swing ZPs would also need more attention in terms of MCC implementation. The table below depicts Zilla Parishads with low REVERSECOMP quotient, which implies that a high degree of competition will exist between the political parties in the elections in these ZPs.

Table 7: List of Swing Zilla Parishads (with Low REVERSECOMP Values)

Zilla Parishad	Average VT	Average COMP
Chandrapur	72.25	8.27
Nanded	70.18	8.17
Buldhana	73.79	8.15
Nagpur	67.34	8.13
Aurangabad	68.59	7.84
Hingoli	73.36	7.71
Washim	72.32	6.96
Akola	67.58	6.95
Amravati	66.20	6.52
Jalna	71.68	6.51
Wardha	70.30	6.47
Gadchiroli	74.27	5.73

In the above table, 8 out of 12 ZPs have a Voter Turnout of more than 70 per cent; thus, nearly 67 per cent of the ZPs are high VT ZPs. In fact, higher competition between parties only exists in higher VT areas. Areas with high VT numbers are ripe for witnessing higher level of competition, because it is only with higher VT numbers that a lesser dominant party gets a true chance at breaking the dominant party's stronghold. The following table shows higher REVERSE COMP quotient, which implies lower degree of political competition.

Table 8: List of Zilla Parishads with Low Competition Amongst Political Parties (High REVERSE COMP values)

Zilla Parishad	Average VT	Average COMP
Pune	66.96	14.756
Satara	68.90	14.512
Nandurbar	64.95	14.314
Sangli	72.16	14.111
Dhule	63.36	12.801
Ratnagiri	62.34	12.681
Sindhudurg	65.62	12.498
Solapur	69.35	12.496
Ahmednagar	67.05	12.288
Kolhapur	75.41	12.058
Latur	70.41	11.982
Osmanabad	69.14	11.333

In the above table, it can be seen that only 3 out of 12 ZPs i.e. only 25 per cent have high VT ratios. Most of the ZPs have VT ratios of less than 70 per cent. This again supports the observation made earlier that higher political competition normally seems to happen in areas where the VT is high. Areas with lower voter turnout normally do not show a very high level of competition between political parties; in fact a single party dominance may be observed in areas with lower VT. In order to check this, the above table with low competition amongst political parties is re-done below, without including Sangli,

Kolhapur and Latur, which are the high VT areas. The table shows the political parties that have been in power from 1994 to 2014.

Table 9: Parties That Have been in Power in low Competition ZPs

Division	**Zilla Parishad**	**R1**	**R2**	**R3**	**R4**
Pune	Pune	INC	NCP	NCP	NCP
Pune	Satara	INC	NCP	NCP	NCP
Nasik	Nandurbar	INC	INC	NCP	INC
Nasik	Dhule	INC	INC	INC	INC
Konkan	Ratnagiri	SS	SS	SS	SS
Konkan	Sindhudurg	SS	SS	INC	INC
Pune	Solapur	INC	NCP	NCP	NCP
Nasik	Ahmednagar	INC	NCP	INC	NCP
Aurangabad	Osmanabad	INC	NCP	INC	INC

The table shows a very interesting trend. Except in Sindhudurg and Ahmednagar, the same party has won the majority in at least 3 rounds of elections. This implies that low competition ZPs with low voter turnout are actually perfect areas wherein one gets to witness single- party dominance. Of course, the fact that there is a single party dominance does not imply that the same party dominates in the elections. There is one more observation to be made here, which ties up with the arguments made whilst discussing political alignment. Just by observing this table, it is very easy to see how deeply entrenched the INC-NCP coalition is in the ZPs of Maharashtra. In the section on political alignment, it has been shown that once the State Government changed from SS-BJP in R1 to INC-NCP in R2, the jump in political alignment is huge. Thus, INC-NCP is definitely present in the high competition areas together with other political parties. But it is also the most dominant Party/ Coalition in ZPs Where Single Party Dominance Is Observed.

vii Seats Won By Independent Candidates (IND)

The variable IND describes the proportion of seats won by independent candidates in Zilla Parishad elections. Following are the summary statistics for IND across 4 rounds

of elections.

	IND _ R1	**IND_ R2**	**IND_ R3**	**IND _ R4**
Mean	9.42	4.40	7.25	4.51
Std. Deviation	9.40	5.70	6.56	4.52
Minimum	0.00	0.00	0.00	0.00
Maximum	36.84	31.37	23.53	19.61
No. of ZPs in which no seats were won by IND Candidate	7.00	7.00	7.00	7.00

The above table shows the summary statistics describing the variable IND. The proportion of seats won by independent candidates in ZPs shows a cyclical pattern. It is high in R1 and R3 but lower in R2 and R4. Across all 4 rounds of elections, the average proportion of seats held by independent candidates is around 6.39 per cent. In contrast, the average proportion of seats won by independent candidates in Municipal Councils and Nagar Panchayats is nearly triple and stands at 17 per cent. Thus, there is a much lesser proportion of independent candidates winning ZP elections as compared to Municipal Council elections. The table above further indicates that the minimum value of IND is 0 for all four rounds of elections. This implies that in every round, there are constituencies in which not a single seat is won by independents. Most interestingly, the maximum value in none of the rounds is 100, indicating that there are no ZPs in which all seats are captured by independents. The following table gives a list of ZPs in every round wherein there are no seats won by independents and wherein all seats are won by independents.

Table11: List of Zilla Parishads in R2, R3 and R4 where no Seats were won by Independents

R1	**R2**	**R3**	**R4**
Akola	Beed	Jalna	Chandrapur
Dhule	Gondia	Latur	Jalgaon
Nandurbar	Hingoli	Nandurbar	Kolhapur
Ratnagiri	Nasik	Nasik	Latur
Sangli	Raigad	Raigad	Nandurbar
Sindhudurg	Satara	Satara	Osmanabad
Washim	Sindhudurg	Sindhudurg	Sindhudurg

It is only in Sindhudurg that not even a single seat has been won by independent candidates

in any of the 4 rounds of elections.

vii. Cluster Analysis of IND

We apply the cluster analysis on the IND variable in order to identify those Zilla Parishads wherein proportion of independents is high, medium and low. The cluster classification indicates that 17 ZPs fall in the "low" independent representation, 15 ZPs which have a medium level of the same and only 1 ZP (Gadchiroli) which has a high proportion of independent candidates winning the elections. Zilla Parishads, in which less than 5.72 per cent of seats have been won by independents, belong to the low IND cluster. It is interesting to note that the average value of IND for Sindhudurg is 0, implying thereby that no independent candidate has won a seat in any of the successive rounds of elections in Sindhudurg. Those ZPs, in which 6 per cent to 11.75 per cent of seats belong to independent candidates, are in the medium IND cluster. Gadchiroli ZP, with 25.6 per cent seats belonging to independent candidates, is the only ZP getting classified as belonging to the high IND cluster.

Is there a relationship between IND and VT values? Only 33 per cent of the ZPs belonging to low IND cluster show high VTs. 55 per cent of the ZPs belonging to the medium IND cluster show high VTs. Finally, Gadchiroli ZP, which is the only ZP getting classified as having high IND, belongs to the high VT cluster. Thus, 100 per cent of ZPs in high IND cluster also have high VT. This implies that IND and VT seem to have a direct relationship with each other. As we move from low IND cluster to the high IND cluster, the numbers of ZPs showing high VTs keep on rising. This goes to indicate a powerful result. It is only in high VT areas that independent candidates have a higher chance of winning. Thus, higher VT is important, not only because it brings out people's choice correctly, but also because it creates a true level playing field between independent candidates and those with party tickets.

viii. Proportion of SC and ST In The Population (SCST)

The proportion of SC and ST population (SCST) in the relevant areas is given in the Census and hence is taken as a basis for reservation considerations for 10 years, in which typically 2 rounds of elections are held. In areas governed by most Zilla Parishads, SCST does not show much variation across time. The average SC and ST population proportion in Maharashtra for areas governed by ZPs in every round has more or less remained at 25 per cent. The following tables use a cluster analysis to group ZPs into clusters having high, medium and low SCST ratios. The cluster analysis places only the Nandurbar Zilla Parishad, with SCST at 80.28 per cent, in the cluster with high proportion of SCST.

Table 12: ZPs with High Proportion of SC and ST Population

Division	Zilla Parishad	SCST_R4
Nasik	Nandurbar	80.28

The medium SCST cluster contains a minimum value of 26.7 per cent and a maximum value of 51.19 per cent. The average SCST value for this cluster is 35.27, which is very distant from the Nandurbar value of 80.28 per cent. The low SCST cluster contains a minimum value of 2.59 in Ratnagiri and 23.26 in Jalgaon. The average for the low SCST cluster stands at 15.05 per cent. Thus, the low, medium and high SCST clusters have centroids at 15.05 per cent, 35.27 per cent and 80.28 per cent respectively.

Table 13: Comparison of Average of SCST Population Proportion and Reservation Proportion across Different Rounds of Elections of ZPs

	R1	R2	R3	R4	Overall Average
Mean of RES	52.412	52.921	52.568	51.490	52.348
Std. Deviation of RES	14.793	14.860	14.860	14.328	
Mean of SCST	26.043	25.850	24.761	25.608	25.565
Std. Deviation of SCST	15.128	14.884	14.721	15.450	

The above table shows that the average level of SCST population as a proportion of entire district rural population stands at 25.65 per cent across all rounds of elections. The proportion of seats reserved for SC, ST and BCC in ZPs stand at about 52.34 per cent across all rounds of elections

ix. Development Score (DEV)

DEV refers to the development quotient of an area. It is calculated as the proportion of the per capita income of a district to the total per capita income of all districts in Maharashtra. The main limitation of using DEV as a development proxy is that data on per capita income at district level is only available in Census 2011 and hence, there is no way in which the effect of economic development on political or electoral variables can be captured across time. Thus, the analysis of DEV in this study has a static interpretation. Cluster analysis tools have been applied to group districts of Maharashtra into high, medium and low income groups. Based on the clusters of high, medium and low income districts, it will now be pertinent and interesting to examine whether these clusters correspond to a particular type of VT. Similarly, does development have an effect on political alignment? Or can it affect the proportion of seats which independent candidates can win? These and

other correlations are explored afterwards.

x. Correlations between Key Variables

The following table shows the correlation co-efficients between the main electoral variables defined and analyzed.

Table 14: Correlation Co-Efficients between Key Electoral Variables and Implications for Electoral Policy

Variables	Correlation co-efficient	Interpretation	Implication
VT and REVERSE COMP	-0.28*	Higher VT is observed in swing districts: Contest will be extreme	Culturally, high VT districts are important for MCC implementation
VT and IND	0.3*	Independents win more when VT is high	Creating more voter awareness and increasing VT is the best way of assuring a level playing field to independent candidates
VT and RES	-0.22*	Reservation proportion of seats affects VT negatively.	There is a perception issue that areas with huge SC or ST pockets will exhibit higher VT and very high political activism. However, data trends show opposite results.
VT and POL	0.054	No relationship observed between voter turnout and political alignment	
VT and DEV	-0.4**	Higher the development of a district, lesser is the Voter Turnout witnessed at a district aggregate	Those districts with higher per capita income have to be addressed more urgently and intensely for increasing voter awareness so as to enhance VT.

POL and RES	0.31*	ZPs with higher proportion of reserved seats show higher political alignment to the State Government	
POL and DEV	-0.03	Correlation coefficient is insignificant. No relationship is observed between development quotient and political alignment	
REVERSE COMP and RES	-0.21*	Higher reservation proportion in seats is likely to attract very high level of competition amongst political parties	In pockets with high SC or ST population, higher VT may not occur i.e. voter activism may not be very high, but political party activism likely to be high. MCC implementation needed.
REVERSE COMP and DEV	0.27*	Higher the development of a district, higher is REVERSE COMP i.e. lower is the competition between political parties.	Political parties are more active in creating vote banks at grassroots; MCC implementation should be targeted more actively in districts with lower income levels.

IND and DEV	-0.15	Independents are more likely to win in less developed areas with higher VT; however this result is statistically insignificant and hence cannot be interpreted	Creating more voter awareness and increasing VT is the best way of assuring a level playing field to independent candidates

Note: * and ** denote significance at 15 per cent and 5 per cent l.o.s. respectively

A. INTERPRETATION OF CORRELATIONS WITH VT

i. VT and the REVERSE COMP

VT and REVERSE COMP show a negative correlation to one another. What is the interpretation of this correlation co-efficient? A high VT goes hand-in-hand with a low REVERSE COMP. A low value of REVERSECOMP implies lower standard deviation in the distribution of seats won by different political parties i.e. it implies higher competition between political parties. Thus, a high VT is consistent with higher competition between political parties and hence, with a higher swing quotient. When the VT in a ZP is high, the elections can potentially swing either way and hence, all the ZPs which belong to the high VT cluster are potentially important for implementation of Model Code of Conduct. It is here that political activism comes into its own and there is a bitterly fought contest between political rivals.

ii. VT and IND

A high level of VT not only has an implication for political parties, but also for candidates who want to contest independently. The correlation coefficient between VT and IND stands at 0.3, indicating that higher VT is consistent with a higher proportion of seats being won by independent candidates. Thus, it is in the high VT ZPs that independent candidates truly stand a chance of winning. One of the chief concerns of the SECM has been to create a level playing field between independent candidates and those contesting on a party ticket. There are many ways in which candidates contesting on a party ticket have a better chance of winning as compared to independent candidates. The best intervention that the SECM can offer to truly create a level playing field is take big strides in terms

of enhancing voter turnout. A higher voter turnout gives a true chance of winning to the independent candidates.

iii. VT and RES

It is a popular perception that voter turnout would be affected by how the seats get reserved in different constituencies. However, the data shows that proportion of reserved seats within a constituency is negatively correlated to voter turnout at all (Correlation co-efficient between VT and RES is -0.22). There could be an underlying design issue that causes this correlation to be negative. As has been said earlier, SCST proportion is declared under the Census. In the next two elections, the same proportion is assumed to prevail and reservation is done accordingly. In the first election after the new proportions are declared, suppose there are 5 constituencies where there is a significantly high proportion of SCs and STs. Then the reserved seats are allotted to those 5 constituencies. Suppose that the VT is also quite high in these constituencies, giving a positive correlation between VT and RES. In the next round of elections, the reserved seats get allotted to the next 5 constituencies due to the rotation system in Maharashtra, where actually the SC and ST population is a little lower. The VT is accordingly lower since the seats get reserved for candidates whose vote bank by caste does not exist in that constituency. Hence, the correlation between VT and RES turns negative. If the negative correlation is higher than the positive correlation in the earlier round of elections, then, the overall correlation co-efficient may show a negative sign.

iv. VT and POL

The correlation co-efficient between VT and POL stands at 0.054, and is statistically insignificant. For all practical purposes, this means that there is no relationship observed between VT and POL. Thus, for the ZP data, there is no relationship observed between voter turnout in areas and the political alignment of the same with the state government.

v. VT and DEV

Higher is the development of a district, more are the ways in which voters express their "voice" and hence lesser is the importance given to elections as a mode of expression. Hence, voters' apathy is typically an issue that is relevant for well-developed districts. The correlation co-efficient accordingly exhibits a negative sign (the correlation between VT and DEV is-0.4) and is statistically significant. *Thus, higher voter turnout areas normally exhibit a high level of competition between political parties, a higher swing factor and a higher chance of winning for independents. Voter turnout does not seem to be associated with political alignment shown by the ZP to the State Government. Higher the proportion of seats reserved for SC, ST or BCC candidates in a ZP, lower seems to*

B. INTERPRETATION OF CORRELATIONS WITH POL

i. POL and RES

The data trends reveal that those ZPs in which the proportion of reserved seats to the total number of seats is higher tend to exhibit a higher political alignment to the State Government. It is to be noted that there is again no theoretical construct that helps in understanding why this could be the case; this data trend would have some value when forecasting studies are undertaken to understand which ZPs would be more likely to get State incumbents in power at the local level.

ii. POL and DEV

Political alignment shows a negative correlation with development index. This could be interpreted to mean that the State incumbent plays a more active role in influencing local politics of the less developed areas as compared to the more well developed areas. *Thus, higher political alignment is witnessed in districts with lower development, with higher proportion of SC and ST population.*

2. Interpretation of correlations with REVERSE COMP

i. REVERSECOMP and RES

This is an extremely interesting result. The correlation co-efficient between REVERSE COMP and RES stands at -0.21. Thus, when the proportion of reserved seats is high in a constituency, REVERSECOMP tends to be low there i.e. political competition tends to be very high. Through a reserved seat, a political party can gain quick access to a large number of votes based on the simple emotional lure that a reservation offers. Hence, political parties tend to have more bitterly fought contests when the proportion of seats reserved for SC, ST or BCC candidates is higher.

ii. REVERSECOMP AND DEV

REVERSE COMP and DEV show a positive correlation co-efficient (stands at 0.27). REVERSE COMP captures the standard deviation in the distribution of seats won by political parties and hence, higher the REVERSE COMP, lesser is the competition between different political parties. This result implies that districts with higher development quotients typically exhibit lower competition between political parties. Political parties vie more to get to the vote bank at the grassroots and thus, the real "swing" districts, where there will be bitter contests amongst political parties, will be seen more in the districts with a lower development quotient. Thus, from a perspective of MCC implementation, more scrutiny has to be done on the districts with lower development characteristics.

Thus, higher competition amongst political parties will be witnessed in ZPs with higher reservations and with lower development quotients.

3. Interpretation of correlations with IND

i. IND and VT

This is already discussed above. Independent candidates stand a higher chance of winning elections in areas with higher voter turnout.

ii. IND and DEV

Independent candidates win higher proportion of seats in less developed districts with higher VTs. This is the interpretation of a positive correlation coefficient. However, the correlation co-efficient is insignificant, which implies that no relationship exists between these two variables. *Thus, independent candidates stand a higher chance to win elections in ZPs governing less developed districts with high voter turnouts.* The following table summarizes the interpretations of the correlation co-efficients.

Table 15: Summary of Correlations in key Election Variables

Variable	Summary of Correlations
VT	Higher voter turnout areas normally exhibit a high level of competition between political parties, a higher swing factor and a higher chance of winning for independents. There is no observed correlation between voter turnout and political alignment. Higher Voter turnout is observed in ZPs with lower proportion of seats reserved for SC, ST or BCC candidates. More the development of a district, lesser is the voter turnout experienced in the ZP elections.
POL	Districts with higher proportion of reserved seats are seen to be more politically aligned with the State Government. More well developed a district, lesser is the political alignment with the State Government.

REVERSE COMP	Competition amongst political parties is higher in areas with higher proportion of reservations. Political parties are more active in the grassroots; lesser developed a district; more is the competition amongst political parties to have a presence in that district.
IND	Independent candidates stand a higher chance of winning elections in areas with higher voter turnout.

IV. CONCLUDING REMARKS

This paper analyzes and summarizes the past data of Zilla Parishad elections in Maharashtra to bring out important insights into the behavior of several variables. This not only helps in understanding the patterns in key electoral variables better, but also has immense value in terms of planning relevant policies for the upcoming ZP elections. Average voter turnout for ZP elections across all rounds of elections stands at about 69 per cent. The voter turnout percentage has kept on decreasing with every successive round of elections; this should be the cause of some worry for the SECM. The average VT in ZP elections at 69 per cent is lower as compared to the average VT in Municipal Councils, which are the closest urban counterparts to ZPs. Average VT in Municipal Councils is 70.7 per cent. This is a surprising result, because it is normally observed that rural local body elections in Indian states normally bring about higher VTs. The lower VT could be a reflection of the huge level of migration that is happening from rural to urban areas. In fact, urbanization and migration could well be the two main issues that SECM will have to focus on in the coming years. High VT is observed in developed and developing districts alike. This implies that VT depends on the voting culture in specific areas. An observation which supports the above point is that the correlation coefficient between VT in a round of elections and the previous round tends to be positive. Thus, a ZP with a high turnout in the last round of elections is likely to show higher turnouts in the next round too. Thus, in influencing voter turnouts, it is important to acknowledge the role of the "voting culture" of that area.

The paper uses a cluster approach to identify those ZPs where voter turnout is likely to be low. Around 52 per cent of seats are reserved for SC, ST and BCC candidates across all Zilla Parishads. It is a popular perception that voter turnout gets affected by how the seats get reserved in different constituencies. However, the data shows that proportion of reserved seats within a constituency has a very mild impact if at all, and that too negative. However, even if reservation of seats does not bring about political

activism from perspective of voters, it does bring about higher levels of political activism from perspective of political parties. Political parties tend to engage in greater level of competition in those ZPs where the reservation of seats for SC, ST and BCC candidates is higher. Political parties also engage in more tightly fought contests when the voter turnout is high. With a lower voter turnout, chances of a single party dominating the distribution of seats are higher. Hence, if a political party has a stronghold over a Zilla Parishad, and if the voter turnout in that ZP tends to be low, there is a chance for the competitor party to try and break the stronghold of the former. Hence, it is in such ZPs that there will be bitter contests amongst political parties. The study identifies those ZPs wherein such patterns prevail; it is in these ZPs that implementation of the Model Code of Conduct will be very important. Data also shows that political parties engage in tougher competition over seats in areas with lower development quotients. This implies that political parties try more to connect with the voter to the grassroot level. Thus, high voter turnout areas in less developed areas with higher level of reservations for SC, ST and BCC candidates are the obvious contenders for witnessing bitterly contested elections between political parties. It is here that the MCC machinery should be concentrated.

Around 6.39 per cent of the seats in Zilla Parishads are held by independent candidates. In comparison, 17 per cent of seats are won by independent candidates in the Municipal Council and Nagar Panchayat elections. Independent candidates stand a higher chance of winning elections in ZPs governing less developed districts with high voter turnouts. Thus, the study creates numerous insights pertaining to voter turnout, political alignment, competition amongst political parties, dynamics of reservation of seats for SC, ST and BCC candidates, dynamics of seats won by independent candidates etc. While this analysis is definitely relevant for posterity, it aims to fill in the gaps of information so that the SECM is aided in crafting electoral policies.

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2

Agricultural Sustainability and Livelihood Security : An Economic Analysis of Selected States in India.

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ABSTRACT:

This paper aims to propose and empirically illustrate practical utility and policy relevance of SLSI to evaluate the relative agricultural sustainability of selected twenty-nine states of India. The farming problems such as drought, fragmentation and marginalization of land, poor irrigation facilities, indebtedness of the farmers, deficiency of markets and increasing disparity in different socio-economic indicators among the states have created hindrances to the successful development of sustainable agriculture in India. Sustainable livelihood security index (SLSI) as a composite index of its three components such as ecological security index (ESI), economic efficiency index (EEI), and social equity index (SEI) is used to recognise essential conditions and regional disparities among the states for sustainable agricultural development. We have made an attempt to undertake a comparative study of two time period i.e. period I (2007 to 2011) and period II (2013 to 2018) to examine the improvement of different indicators of sustainable agricultural development in selected states (twenty-nine) of India. The empirical results reveal that sustainable livelihood security index has increasing trend i.e. 0.428 in period I to 0.452 in period II, also the study found that maximum and minimum SLSI values was 0.625 to 0.294 during period I and 0.639 to 0.305 during period II respectively. The empirical illustration shows that there were wide regional inequalities in different states of India for successful development of sustainable agriculture. Most of the states of India are comes under medium category of SLSI which indicates that the constructive efforts required for the environmental and socio-economic development of the different states of India.

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Keywords: *Sustainable livelihood security index (SLSI), Ecological security, Economic efficiency, Social equity, Agricultural sustainability*

I. INTRODUCTION:

Agriculture is a core occupation in India as far as employment and income is concerned, nearly 48% households were involved in agriculture and allied activities (NABARD 2016-17) and the share of agriculture in GDP was 15.87% in 2019 (MOSP 2018-19). It is considered as an engine of growth for developing countries including India. In the process it has been facing numerous challenges to achieve foremost important goals like ecological sustainability, adequate food production, health, financial affluence and livelihood sustainability.

The Brundtland Commission defined sustainable development as the "ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs (World commission on Environment and development 1987). Sustainable agricultural development is "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations" (FAO 1991). The major proportion of population of India lives in rural areas and the practice of sustainable agricultural development will help for lifting rural livelihood, eradication of poverty, reducing the unemployment, lifting income of the farmers and agricultural workers.

Agriculture practices has been influencing the environment and in turn, it impacted by the environment. Hence, environmental friendliness of agriculture is most important factor as far as sustainability of human beings is concerned. (Harron, Iffat and Shahzad 2014). After green revolution the agricultural production was increased tremendously due to excess use of high yielding variety of seeds (HYVs), chemical fertilizers, pesticides and excessive use of water resulting degradation of land, soil quality and environment too.

In order to examine sustainability of a region, Swaminathan has defined 'Sustainable

Livelihood Security Index' (SLSI) as which are ecologically secure, economically efficient and socially equitable are assessed. It implies the protection or assurance of the means of livelihood for the masses not only at present time but also in future. (Swaminathan M.S 1991). The sustainable livelihood security index (SLSI) is worked as a litmus to check whether or not certain essential circumstances for sustainable development are present in a given region or not. The SLSI is used to evaluate the existing condition and the further policy necessities relating to sustainable development (Singh, P. K., and Hiremath. B. N. 2010) Providing sustainable livelihood security to the people assure that they will meet their own needs resulting to reduce pressure on the environment and it will be possible for more people to meet their livelihood needs in the future (Chamber R 1986). In present research paper an attempt is made to assess agricultural sustainability and livelihood security of different states of India by using sustainable livelihood security index (SLSI) as a policy tool.

II. RESEARCH METHODOLOGY AND DATABASE:

SELECTION OF THE STUDY AREA:

For estimation of sustainable livelihood security index (SLSI) in India. We have purposefully selected 29 states for the study on the basis of availability of state wise secondary data. It will very useful to make comparative study and estimate the agricultural sustainability and livelihood security.

ANALYTICAL FRAMEWORK:

The present research paper is purely based on secondary data, which is collected from various economic surveys of India, census reports of Government of India and online available database.

The researcher had adopted the UNDP methodology to construct the sustainable livelihood security index in India. SLSI as a cross-sectional tool to assess the comparative sustainability standing and basic prerequisite of sustainable development of agriculture in the given region (Saleth. R. M., and M. S. Swaminathan 1993). The systematic approach essential for operationalizing sustainable livelihood security (SLS) in the

form of sustainable livelihood security index (SLSI) is classified by three propositions of sustainable development of agriculture (SDA). First, three-dimensional conceptions of the SDA (i) ecological security (ii) economic efficiency (iii) social equity in both intra and interregional contexts. Second, for assessing the contextual as well as dynamic nature of SDA analysis, sustainability needs to be relative rather than absolute in both time and space. Third, in an operational approach, the multidimensional conceptions of SDA require the SLSI to be a composite of three interacting component indices, that is, ecological security index, economic efficiency index and social equity index. (Hatai L. D., and C. Sen 2008)

CONSTRUCTION OF SUSTAINABLE LIVELIHOOD SECURITY INDEX:

Let X_{ijk} and $SLSI_{ijk}$ represent the value of i^{th} variable, j^{th} component and k^{th} block and index for i^{th} variable representing the j^{th} component of the SLSI of k^{th} block respectively. Then, we have, for positive implication we used equation (1) and for negative implication we have used equation (2)

$$SLSI_{ijk} = \frac{X_{ijk} - Mini_{ijk}}{Max_{ijk} - Min_{i_j}} \quad \ldots\ldots\ldots (1)$$

$$SLSI_{ijk} = \frac{Max_{ijk} - X_{ijk}}{Max_{ijk} - Min_{ijk}} \quad \ldots\ldots\ldots (2)$$

$$SLSI_{ijk} = \frac{\sum SLSI_{ijk}}{I} \quad \ldots\ldots\ldots (3)$$

Where,

i= variables (1,2,3……. I)

j = components (1,2,3……. J)

k = blocks (1,2,3……. K)

The numerator in equation (1) and (2) shows that, it measures the extent by which the K^{th} block did better in the i^{th} variable representing the j^{th} components of SLSI as compared to the state showing the worst performance in that component, and the denominator

indicates the range (i.e., the difference between the maximum and the minimum values of the variable representing a given component).

The equation (3) displays three component indices of SLSI, viz. ESI, EEI and SEI were calculated for all variables, the indices for various components of SLSI were calculates as a simple mean by assigning equal weights to the indices of their respective variables. The SLSI has range of 0 to 1 in which a value closer to zero shows low level of sustainability and value near to 1 denotes high level of sustainability.

SELECTION OF VARIABLES:

The selection of variables for calculating SLSI is based on relative concepts and availability of state wise data which can represent the comprehensive three indicators of sustainability viz. ecological security indicator, economic efficiency indicator and social equity indicator.

The selection of variables for assessing sustainability of various states of India, we have used population density as a negative (-Ve) indicator of agricultural sustainability. It plays crucial role for the ecological balance, higher the population density higher will be the pressure on natural resources and therefore lower will be the ecological security. Moreover, higher population density also causes extent of pollution which again responsible for degradation of the environment and obstacle to the sustainability of protected forest areas. Therefore, the variable density of population was selected in opinion of its capability to imitate the amount of human pressure on inclusive ecological safety. (Harron, Iffat and Shahzad 2014). Forest cover is an important positive (+Ve) indicator for ecological balance, higher is the forest area higher will be ecological security and vice versa. It also provides a great source of income and livelihood to the rural population near forest area. Moreover, it also helps to control pollution within atmosphere resulting ecological security. Cropping intensity is third important positive (+Ve) indicator as far as ecological security is concerned. The diversification in the crops will lead to balance and scope to resist the ecological changes. It shows the cropping pattern in different seasons in same piece of land. Taking into account crop diversity, balance and succession plans and hence it is positive indicator of ecological security (Kareemulla, Venkattakumar and Samuel 2017).

Talking about the economic efficiency per capita income is used as a positive (+Ve) indicator, it is the ratio between gross domestic product and total population. It plays a crucial role in economic development as well as it determines the livelihood status of the citizens of country. The agricultural income is determined by agricultural output vis-à-vis GDP and employment of the country. Another important indicator to estimate economic efficiency is consumption of fertilizer which is nowadays backbone of farming. It has two sides (i.e. positive and negative) as far as sustainability of agriculture is concerned, the positive and negative sides. The positive (+Ve) side is that it helps to improve nutritional requirements of crops resulting higher productivity and higher output. In contrast negative (-Ve) side dampens the health of the soil in the long-term causing soil salinity and alkalinity which is not a good sign for sustainability of agriculture. Here we considered consumption of fertilizer as a positive indicator because it played a crucial role in increasing the agricultural output and hence increasing the economic efficiency. Milk production is third positive (+Ve) indicator of economic efficiency. This indicator is acting as supplementary and complementary to the farming sector activities in rural India. It gives great source of income to the rural people because it doesn't require extra inputs for the livestock, that can be obtained from farming activities. Therefore, it helps to improve the rural livelihoods.

Social equity indicator is another component of SLSI. To estimate SEI, the consumption of electricity by the households in different states of India is taken into consideration. The use of electricity for household purpose is the major indicator of livelihood. Developing countries like India every household is not able to get the electricity in home in the remote areas, so electricity to all households is the idea behind this indicator, which plays important role in assuring irrigation and water supply to improve agricultural output and also household water supply for safe drinking water. The next indicator is infant mortality rate which is consider as a negative (-Ve) indicator of sustainability. The lack of health facilities, malnutrition, illiteracy among females, weak health and sanitation etc. are some of the reasons responsible for the infant mortality. Higher is the IMR lower will be the social equity and vice versa. Speaking about the female literacy as a positive

(+Ve) indicator of social equity, it played a crucial role to bridging the gap between male and female in the society. Because females constitute half the population, higher the female literacy, more will be the work participation and vice versa. Female literacy leads to social awareness among the woman in particular and society in general resulting the social equity.

III. RESULTS AND DISCUSSION:

India is huge and diversified nation with different climatic conditions, soil quality, cropping pattern, farming techniques and methodologies. We have made an attempt to assess comparative study of agricultural sustainability for two different time periods i.e. Period I (2007-11) and Period II (2013-18).

PROCEDURE FOR CONSTRUCTING SUSTAINABLE LIVELIHOOD SECURITY INDEX:

To estimate index values of ecological security, economic efficiency and social equity indicators we applied equation of sustainable livelihood security index (SLSI) of the representative values and the value of SLSI for whole region is calculated by talking arithmetic mean of its component indices by using equation that gives composite index.

TABLE 1: INDICES VALUES OF ESI, EEI AND SEI FOR ESTIMATING SUSTAINABLE LIVELIHOOD SECURITY INDEX: (2007-11)

INDICATOR	ECOLOGICAL SECURITY			ECONOMIC EFFICIENCY			SOCIAL EQUITY		
STATES	Density of Population Index	Forest Cover Index	Cropping Intensity Index	Per Capita Income at Current Prices Index	Consumption of Fertilizers Index	Milk Production Index	Consumption of Electricity (household) Index	Infant Mortality Rate Index	Female Literacy Index
Andhra Pradesh	0.972	0.240	0.283	0.338	0.985	0.504	0.404	0.313	0.317
Arunachal Pradesh	1.000	0.838	0.319	0.271	0.009	0.001	0.101	0.604	0.191
Assam	0.965	0.331	0.436	0.108	0.258	0.038	0.023	0.095	0.394
Bihar	0.907	0.063	0.394	0.000	0.740	0.305	0.000	0.262	0.000
Jharkhand	0.965	0.341	0.231	0.093	0.391	0.074	0.234	0.404	0.105
Delhi	0.000	0.063	1.000	1.000	0.105	0.022	0.651	0.611	0.762
Goa	0.962	0.516	0.239	0.934	0.201	0.002	1.000	1.000	0.774
Gujrat	0.974	0.089	0.179	0.419	0.637	0.432	0.511	0.345	0.452
Haryana	0.950	0.000	0.845	0.624	0.871	0.294	0.521	0.284	0.414
Himachal Pradesh	0.990	0.256	0.768	0.374	0.246	0.051	0.514	0.422	0.628
Jammu & Kashmir	0.991	0.096	0.565	0.085	0.405	0.078	0.177	0.367	0.181
Karnataka	0.972	0.192	0.240	0.333	0.643	0.235	0.370	0.451	0.435
Kerala	0.914	0.400	0.323	0.420	0.407	0.123	0.209	0.975	1.000
Madhya Pradesh	0.980	0.322	0.425	0.099	0.315	0.353	0.175	0.000	0.314
Chhattisgarh	0.985	0.548	0.212	0.418	0.384	0.047	0.277	0.222	0.343
Maharashtra	0.968	0.189	0.324	0.523	0.540	0.381	0.418	0.651	0.621
Manipur	0.991	0.942	0.000	0.092	0.226	0.003	0.017	0.956	0.502
Meghalaya	0.990	0.659	0.210	0.250	0.057	0.003	0.194	0.182	0.485
Mizoram	0.997	1.000	0.006	0.227	0.185	0.000	0.086	0.593	0.982
Nagaland	0.989	0.758	0.294	0.103	0.006	0.002	0.023	0.775	0.519
Orissa	0.976	0.425	0.501	0.169	0.283	0.082	0.172	0.025	0.318
Punjab	0.950	0.042	0.927	0.420	1.000	0.470	0.701	0.524	0.554
Rajasthan	0.984	0.063	0.333	0.168	0.204	0.613	0.243	0.131	0.197
Sikkim	0.993	0.557	0.526	0.411	0.000	0.001	0.280	0.629	0.500
Tamil Nadu	0.950	0.190	0.155	0.415	0.916	0.336	0.516	0.691	0.573
Tripura	0.969	0.788	0.150	0.133	0.210	0.004	0.043	0.618	0.582
Uttar Pradesh	0.927	0.093	0.554	0.039	0.703	1.000	0.095	0.047	0.167
Uttaranchal	0.984	0.538	0.620	0.345	0.601	0.065	0.350	0.447	0.486
West Bengal	0.905	0.150	0.883	0.249	0.692	0.213	0.141	0.589	0.485

(Source: Compiled by author)

TABLE 2: INDICES VALUES OF ESI, EEI AND SEI FOR ESTIMATING SUSTAINABLE LIVELIHOOD SECURITY INDEX: (2013-18)

INDICATOR STATES	ECOLOGICAL SECURITY			ECONOMIC EFFICIENCY			SOCIAL EQUITY		
	Density of Population Index	Forest Cover Index	Cropping Intensity Index	Per Capita Income at Current Prices Index	Consumption of Fertilizers Index	Milk Production Index	Consumption of Electricity (household) Index	Infant Mortality Rate Index	Female Literacy Index
Andhra Pradesh	0.974	0.166	0.274	0.353	0.981	0.564	0.545	0.341	0.180
Arunachal Pradesh	1.000	0.924	0.356	0.362	0.001	0.001	0.149	0.385	0.176
Assam	0.966	0.389	0.499	0.093	0.305	0.039	0.040	0.043	0.372
Bihar	0.904	0.051	0.498	0.056	0.786	0.391	0.000	0.255	0.017
Jharkhand	0.965	0.313	0.183	0.146	0.346	0.086	0.269	0.423	0.090
Delhi	0.000	0.114	0.682	1.000	0.713	0.012	0.710	0.731	0.719
Goa	0.967	0.684	0.245	0.821	0.138	0.002	1.000	1.000	0.742
Gujarat	0.974	0.047	0.251	0.150	0.560	0.583	0.714	0.418	0.460
Haryana	0.951	0.000	0.947	0.568	0.871	0.403	0.713	0.341	0.359
Himachal Pradesh	0.991	0.284	0.768	0.418	0.246	0.059	0.645	0.514	0.609
Jammu & Kashmir	0.991	0.083	0.617	0.130	0.412	0.100	0.281	0.505	0.136
Karnataka	0.973	0.218	0.253	0.450	0.630	0.305	0.504	0.543	0.393
Kerala	0.925	0.589	0.311	0.310	0.441	0.124	0.274	0.942	1.000
Madhya Pradesh	0.981	0.260	0.616	0.181	0.362	0.576	0.290	0.000	0.187
Chhattisgarh	0.985	0.453	0.244	0.222	0.463	0.061	0.366	0.202	0.202
Maharashtra	0.969	0.156	0.386	0.497	0.530	0.477	0.537	0.697	0.580
Manipur	0.991	0.896	0.000	0.052	0.157	0.003	0.041	0.962	0.522
Meghalaya	0.990	0.880	0.222	0.207	0.032	0.003	0.208	0.183	0.537
Mizoram	0.997	1.000	0.000	0.193	0.057	0.000	0.130	0.519	0.934
Nagaland	0.991	0.867	0.341	0.284	0.021	0.003	0.068	0.889	0.611
Orissa	0.978	0.356	0.170	0.183	0.428	0.092	0.164	0.091	0.298
Punjab	0.953	0.000	1.000	0.329	1.000	0.515	0.833	0.649	0.475
Rajasthan	0.984	0.015	0.451	0.240	0.231	0.886	0.356	0.173	0.000
Sikkim	0.994	0.526	0.924	0.673	0.000	0.002	0.299	0.779	0.605
Tamil Nadu	0.952	0.201	0.275	0.473	0.744	0.348	0.654	0.760	0.539
Tripura	0.970	0.848	0.775	0.000	0.229	0.281	0.060	0.611	0.775
Uttar Pradesh	0.928	0.030	0.631	0.101	0.720	1.000	0.134	0.106	0.168
Uttaranchal	0.985	0.505	0.630	0.473	0.668	0.112	0.546	0.404	0.459
West Bengal	0.910	0.186	0.937	0.109	0.499	0.237	0.204	0.553	0.470

(Source: Compiled by author)

Table 1 shows that the estimated indices of the period I (2007-11) by using the formula of sustainable livelihood security index (SLSI) taking into consideration the positive and negative indicators. We have estimated ecological security, economic efficiency and social equity indicators for each and every sub indicator. Taking about the construction of ecological security, we have considered density of Population Index, forest cover index and cropping intensity index respectively. Speaking about density of Population Index, Arunachal Pradesh is having highest index value and Delhi had lowest. Similarly, for forest cover Mizoram has highest index and Haryana has lowest and for cropping intensity, Delhi has highest index while Manipur has lowest.

Now, speaking about the economic efficiency, we have used per capita income at current Prices Index, Consumption of Fertilizers Index and Milk production index respectively. The analysis reveals that Delhi, Punjab and Uttar Pradesh had highest indices value and Bihar, Sikkim and Mizoram had lowest values in period I (2007-11) respectively.

Moving towards the third indicator i.e. social equity we have constructed consumption of electricity by the household's, infant mortality rate and female literacy index respectively. In which Delhi had highest index value for both consumption of electricity by the household's and infant mortality rate while Kerala had highest female literacy index value and Assam, Madhya Pradesh and Bihar had lowest respectively.

Table 2 reveals that the constructed indices of the period II (2013-18) by using the formula of sustainable livelihood security index (SLSI) taking into consideration the positive and negative indicators. Talking about the ecological security, we have estimated density of Population Index, forest cover index and cropping intensity index respectively. Speaking about density of Population Index, Arunachal Pradesh has highest indices value and Delhi had lowest. Similarly, for forest cover Mizoram has highest index value and Haryana and Punjab has lowest and for cropping intensity, Punjab was at top while Mizoram and Manipur were at bottom.

For economic efficiency, we have estimated per capita income at current prices index, Consumption of Fertilizers Index and Milk production index for period II. The result shows that Delhi, Punjab and Uttar Pradesh had highest indices value and Bihar, Sikkim

and Mizoram had lowest values of respective indicators in period II (2013-18)

The third indicator i.e. social equity we have estimated consumption of electricity by the household's index, infant mortality rate index and female literacy index respectively for given period. Goa had highest index value for both consumption of electricity by the household's index and infant mortality rate index similarly Kerala had highest female literacy index and Assam, Madhya Pradesh and Rajasthan had lowest indices values for respective indicators during period II (2013-18).

COMPARATIVE ANALYSIS OF SLSI AND ITS COMPONENT OF DIFFERENT STATES OF INDIA FOR THE PERIOD I (2007-11) AND PERIOD II (2013-18)

The performance of sustainable livelihood security index (SLSI) and its component indices (ESI, EEI and SEI) of the different states are shown in table 4 and table 5. The results show that SLSI has increasing trend from period I (2007-11) to period II (2013-17), however it has wide regional disparity in the sustainability of agriculture in the different states of India.

TABLE 3: SLSI VALUES AND CATEGORIZATION OF MAJOR STATES OF INDIA DURING PERIOD I AND PERIOD II.

SR. NO	CATEGORY OF SLSI VALUE	STATES	
		PERIOD I (2007-11)	PERIOD II (2013-18)
1.	Very High (0.81 Above)	-	-
2.	High (0.61 to 0.80)	Goa, Punjab	Goa, Punjab
3.	Medium (0.41 to 0.60)	Andhra Pradesh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Sikkim, Tamil Nadu, Uttaranchal, West Bengal	Andhra Pradesh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Uttaranchal, West Bengal

4.	Low (0.21 to 0.40)	Arunachal Pradesh, Assam, Bihar, Jharkhand, Jammu and Kashmir, Madhya Pradesh, Chhattisgarh, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan, Tripura, Uttar Pradesh,	Arunachal Pradesh, Assam, Bihar, Jharkhand, Jammu and Kashmir, Madhya Pradesh, Chhattisgarh, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan.
5.	Very Low (Below 0.20)	-	-

(Source: Compiled by author)

Table 3 shows that we have made a category of Very High (0.81 Above), high (0.61 to 0.80), medium (0.41 to 0.60), low (0.21 to 0.40) and very low (Below 0.20) states with the help of indices values of SLSI in both period I and period II.

TABLE 4: ESTIMATED INDICES VALUES OF SUSTAINABLE LIVELIHOOD SECURITY INDEX (SLSI) FOR PERIOD I (2007 to 2011)

STATES	ECOLOGICAL SECURITY INDEX	RANKS	ECONOMIC EFFICIENCY INDEX	RANKS	SOCIAL EQUITY INDEX	RANKS	SUSTAINABLE LIVELIHOOD SECURITY INDEX	RANKS
Andhra Pradesh	0.498	22	0.609	2	0.345	18	0.484	8
Arunachal Pradesh	**0.719**	1	0.093	28	0.299	19	0.370	21
Assam	0.577	15	0.134	24	0.170	26	**0.294**	29
Bihar	0.455	26	0.349	12	**0.087**	29	0.297	28
Jharkhand	0.512	21	0.186	20	0.248	22	0.315	27
Delhi	**0.354**	29	0.376	11	0.675	3	0.468	11
Goa	0.573	17	0.379	10	**0.925**	1	**0.625**	1
Gujarat	0.414	28	0.496	6	0.436	12	0.449	14
Haryana	0.598	13	0.596	3	0.406	16	0.534	3
Himachal Pradesh	0.671	5	0.224	18	0.521	8	0.472	10
Jammu & Kashmir	0.551	18	0.190	19	0.242	23	0.327	25
Karnataka	0.468	24	0.403	8	0.419	14	0.430	15
Kerala	0.545	19	0.317	15	0.728	2	0.530	4
Madhya Pradesh	0.576	16	0.255	17	0.163	27	0.332	23
Chhattisgarh	0.582	14	0.283	16	0.281	21	0.382	20
Maharashtra	0.493	23	0.481	7	0.563	6	0.513	6
Manipur	0.644	8	0.107	26	0.492	9	0.414	17
Meghalaya	0.620	12	0.104	27	0.287	20	0.337	22
Mizoram	0.668	6	0.137	23	0.554	7	0.453	12
Nagaland	0.680	4	**0.037**	29	0.439	11	0.385	19
Orissa	0.634	11	0.178	21	0.172	25	0.328	24
Punjab	0.640	9	**0.630**	1	0.593	5	0.621	2
Rajasthan	0.460	25	0.329	14	0.190	24	0.326	26
Sikkim	0.692	3	0.137	22	0.470	10	0.433	13
Tamil Nadu	0.432	27	0.556	5	0.594	4	0.527	5
Tripura	0.636	10	0.116	25	0.414	15	0.389	18
Uttar Pradesh	0.525	20	0.581	4	0.103	28	0.403	16
Uttaranchal	0.714	2	0.337	13	0.428	13	0.493	7
West Bengal	0.646	7	0.385	9	0.405	17	0.478	9
INDIA	**0.571**	-	**0.310**	-	**0.402**	-	**0.428**	-

(Source: Compiled by author)

TABLE 5: ESTIMATED INDICES VALUES OF SUSTAINABLE LIVELIHOOD SECURITY INDEX(SLSI) FOR PERIOD II (2013-18)

STATES	ECOLOGICAL SECURITY INDEX	RANKS	ECONOMIC EFFICIENCY INDEX	RANKS	SOCIAL EQUITY INDEX	RANKS	SUSTAINABLE LIVELIHOOD SECURITY INDEX	RANKS
Andhra Pradesh	0.471	27	**0.633**	1	0.356	18	0.486	12
Arunachal Pradesh	0.760	3	0.122	25	0.236	23	0.373	21
Assam	0.618	15	0.146	24	0.152	27	**0.305**	29
Bihar	0.484	23	0.411	12	**0.091**	29	0.329	26
Jharkhand	0.487	22	0.192	22	0.261	21	0.313	27
Delhi	**0.265**	29	0.575	5	0.720	3	0.520	9
Goa	0.632	12	0.320	14	**0.914**	1	0.622	2
Gujrat	0.424	28	0.431	10	0.530	9	0.462	14
Haryana	0.633	11	0.614	3	0.471	15	0.573	3
Himachal Pradesh	0.681	7	0.241	18	0.589	7	0.504	11
Jammu & Kashmir	0.564	17	0.214	21	0.307	20	0.362	24
Karnataka	0.481	25	0.462	8	0.480	14	0.474	13
Kerala	0.609	16	0.291	15	0.739	2	0.546	5
Madhya Pradesh	0.619	14	0.373	13	0.159	26	0.384	20
Chhattisgarh	0.561	18	0.249	17	0.256	22	0.355	25
Maharashtra	0.504	20	0.501	7	0.605	6	0.537	6
Manipur	0.629	13	**0.071**	29	0.508	12	0.403	19
Meghalaya	0.697	6	0.080	28	0.309	19	0.362	23
Mizoram	0.666	9	0.083	27	0.528	10	0.426	17
Nagaland	0.733	4	0.102	26	0.523	11	0.453	16
Orissa	0.501	21	0.234	19	0.185	24	0.307	28
Punjab	0.651	10	0.615	2	0.652	4	**0.639**	1
Rajasthan	0.483	24	0.452	9	0.176	25	0.371	22
Sikkim	0.815	2	0.225	20	0.561	8	0.534	7
Tamil Nadu	0.476	26	0.522	6	0.651	5	0.550	4
Tripura	**0.864**	1	0.170	23	0.482	13	0.505	10
Uttar Pradesh	0.530	19	0.607	4	0.136	28	0.424	18
Uttaranchal	0.707	5	0.418	11	0.470	16	0.531	8
West Bengal	0.678	8	0.282	16	0.409	17	0.456	15
INDIA	**0.594**	-	**0.332**	-	**0.430**	-	**0.452**	-

(Source: Compiled by author)

Table 4 shows three indicators such as ESI, EEI, SEI and SLSI of sustainability of agriculture in selected states of India in the period I (2007-11) no state having very high ecological security. The states having high ecological security were Arunachal Pradesh, Uttaranchal, Sikkim, Nagaland, Mizoram, West Bengal, Manipur, Punjab, Tripura, Orrisa, Meghalaya. The states having medium ecological security were Haryana, Chhattisgarh, Assam, Madhya Pradesh, Goa, Jammu and Kashmir, Kerala, Uttar Pradesh, Jharkhand, Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Bihar, Tamil Nadu, Gujrat and only Delhi was low ecological security state and no state was in very low ecological security.

For economic efficiency index (EEI) no state was in very high economic efficiency, the states having high ecological security were Punjab and Andhra Pradesh. The states having medium economic efficacy are Gujrat, Haryana, Maharashtra, Tamil Nadu and Uttar Pradesh. The states having low economic efficacy were Delhi, Goa, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Chhattisgarh, Rajat stan, Uttaranchal and West Bengal. The states having very low economic efficacy were Arunachal Pradesh, Assam, Bihar, Jharkhand, Jammu and Kashmir, Nagaland, Meghalaya, Manipur, Orissa, Sikkim, Tripura.

The third indicator is social equity index (SEI), the state having very high social equity was Goa. The states having high social equity were Delhi and Kerala. The states having medium social equity were Gujarat, Haryana, Karnataka, Chhattisgarh, Maharashtra, Mizoram, Nagaland, Punjab, Sikkim, Tamil Nadu, Manipur, Tripura and Uttaranchal. The states having low social equity were Arunachal Pradesh, Assam, Bihar, Jharkhand, Jammu and Kashmir, Madhya Pradesh, Chhattisgarh, Nagaland, Meghalaya, Manipur, Orissa, Rajasthan, Tripura and Uttar Pradesh. The average value of ESI, EEI, SEI and SLSI of India was 0.571, 0.310, 0.402 and 0.428 respectively in the period I (2007-11).

Table 5 illustrate three indicators such as ESI, EEI, SEI and SLSI of sustainability of agriculture in selected states of India in the period II (2013-18) the state like Tripura and Sikkim comes under very high ecological security. The state's high ecological security in period II were Arunachal Pradesh, Assam, Goa, Haryana, Himachal Pradesh, Manipur,

Meghalaya, Mizoram, Nagaland, Uttaranchal, West Bengal. The other remaining states were in medium ecological security except Delhi, it was under low ecological security category.

Talking about economic efficiency index (EEI) no state was in very high economic efficiency, the states having high ecological security were Punjab and Andhra Pradesh and Haryana. The states having medium economic efficacy are Bihar, Delhi, Gujrat, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Uttaranchal and Uttar Pradesh. The states having low economic efficacy were Delhi, Goa, Himachal Pradesh, Jammu and Kashmir, Kerala, Madhya Pradesh, Chhattisgarh, Orissa, Sikkim and West Bengal. The states having very low economic efficacy were Arunachal Pradesh, Assam, Jharkhand, Mizoram, Nagaland, Meghalaya, Manipur, Tripura.

Talking about social equity index (SEI), the state having very high social equity was Goa. The states having high social equity were Delhi, Punjab and Kerala. The states having medium social equity were Gujarat, Haryana, Himachal Pradesh, Karnataka, Chhattisgarh, Maharashtra, Manipur, Mizoram, Nagaland, Sikkim, Tripura, Uttaranchal and West Bengal. The states having low social equity were Arunachal Pradesh, Jharkhand, Jammu and Kashmir, Chhattisgarh, Meghalaya. The states having very low social equity were Bihar, Assam, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh. The average value of ESI, EEI, SEI and SLSI of India was 0.594, 0.332, 0.430 and 0.452 respectively in the period II (2013-18)

Table 6: Comparative Analysis of Slsi And Net Change In Slsi Value of Period I (2007-11) And Period II (2013-18)

States	**Comapritive Analysis of SLSI**			
	SLSI Period I (2007-11)	**SLSI Period II (2013-18)**	**Net Change In SLSI Value**	**Trend**
Andhra Pradesh	0.484	0.486	+0.002	⇧
Arunachal Pradesh	0.370	0.373	+0.003	⇧

Assam	0.294	0.305	+0.011	⬆
Bihar	0.297	0.329	+0.032	⇧
Jharkhand	0.315	0.313	-0.002	⇧
Delhi	0.468	0.520	+0.052	⇧
Goa	0.625	0.622	-0.003	⇧
Gujrat	0.449	0.462	-0.013	⇧
Haryana	0.534	0.573	+0.039	⬆
Himachal Pradesh	0.472	0.504	+0.032	⇧
Jammu & Kashmir	0.327	0.362	+0.035	⇧
Karnataka	0.430	0.474	+0.044	⇧
Kerala	0.530	0.546	+0.016	⇧
Madhya Pradesh	0.332	0.384	+0.052	⇧
Chhattisgarh	0.382	0.355	-0.027	⇧
Maharashtra	0.513	0.537	+0.004	⇧
Manipur	0.414	0.403	-0.011	⇧
Meghalaya	0.337	0.362	+0.025	⇧
Mizoram	0.453	0.426	+0.027	⇧
Nagaland	0.385	0.453	+0.050	⇧
Orissa	0.328	0.307	-0.021	⇧
Punjab	0.621	0.639	+0.018	⇧
Rajasthan	0.326	0.371	+0.045	⇧
Sikkim	0.433	0.534	+0.101	⇧
Tamil Nadu	0.527	0.550	+0.023	⇧
Tripura	0.389	0.505	+0.116	⇧
Uttar Pradesh	0.403	0.424	+0.021	⇧
Uttaranchal	0.493	0.531	+0.038	⬆
West Bengal	0.478	0.456	-0.022	⬆
INDIA	**0.428**	**0.452**	**+0.024**	⬆

(Sources: compiled by author)

Table 6 reveals that the Comparative analysis of SLSI and Net change in SLSI value during the period I (2007-11) to period II (2013-18). Twenty-two states have shown the

positive change in SLSI value and seven states have shown negative change in the values of SLSI. As far as positive increment is concerned Tripura (+0.116) and Sikkim (+0.101) has shown highest increase in SLSI and for negative, West Bengal (-0.022) and Orrisa (-0.021) shown highest decrease in SLSI from the period I (2007-11) to period II (2013-18). The sustainable livelihood security index has shown increasing trend from 0.428 to 0.452 i.e. net positive change of (+0.024) during the period I (2007-11) to period II (2013-18).

IV. CONCLUSION AND POLICY IMPLICATIONS :

To conclude the policy makers should focus more upon different aspects of sustainable agricultural development considering indices values of selected states of India. The empirical analysis reveals that the sustainability status of most of the states of India in both study periods was in medium category of sustainable agricultural development. The states which needs to attain best ecological, economic and social policies for the betterment of the agricultural sustainability is shown in table 07. Sustainable livelihood security index (SLSI) being a policy tool which perceives not only the states requiring instantaneous responsiveness but also the unambiguous thematic areas in which the efforts can be focused to achieve security of the livelihoods. Which also helps in launching interregional urgencies for the allocation of agricultural resources and highlights the activities and programmes pertaining to each region for sustainable agricultural development.

TABLE 7 : Thematic areas for sustainable agricultural development in India.

States	**Significance In The Components of SLSI**			
	ESI	**EEI**	**SEI**	**SLSI**
Andhra Pradesh	**@**			
Arunachal Pradesh				
Assam			**@**	**@**
Bihar			**@**	**@**
Jharkhand				**@**

Delhi	**@**			
Goa				
Gujrat	**@**			
Haryana				
Himachal Pradesh				
Jammu & Kashmir				
Karnataka				
Kerala				
Madhya Pradesh			**@**	
Chhattisgarh				
Maharashtra				
Manipur		**@**		
Meghalaya		**@**		
Mizoram		**@**		
Nagaland		**@**		
Orissa				**@**
Punjab				
Rajasthan				
Sikkim				
Tamil Nadu	**@**			
Tripura				
Uttar Pradesh				
Uttaranchal			**@**	
West Bengal				

(Sources: Compiled by the author), (Note: The sign "@" indicate that the improvement required in ESI, EEI, SEI and SLSI values in different states of India.)

The table 7 shows that the states which must improve on the different components i.e. ESI, EEI and SEI also the composite index called SLSI. For the ecological security Delhi, Gujrat, Andhra Pradesh and Tamil Nadu must need immediate attention towards environment related issues. There is need to grow the forest area by planting trees, controlling pollution, preventing excessive population etc. Similarly, in the context

of economic efficiency indicator Manipur, Meghalaya, Mizoram and Nagaland need immediate attention to improve economic efficiency, it may include modernization of agriculture by increasing irrigated area, appropriate use of fertilizers, resulting increase in agricultural output. Speaking about social equity indicator, Assam, Bihar, Madhya Pradesh and Uttaranchal has more social inequality; to bridge the social inequality, the Niti Ayog, State planning commissions may adopt policies related to spreading of quality education, better health services and adequate rural infrastructure for socio-economic development and livelihood security of citizens of the country.

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संजय मोहन कुबल

घोषवारा

डॉ. बाबासाहेब आंबेडकर हे भारतीय राज्यघटनेचे शिल्पकार त्याचबरोबर थोर अर्थतंज्ञ, शोषीत व पीडित समाजाचे नेते व कामगार तसेच स्त्रीयांच्या हाक्कासाठी लढणारे म्हणून ओळखले जातात. परंतु त्याच बरोबर डॉ. बाबासाहेब आंबेडकरांचा भारतातील नद्या त्यातून पाण्याचे नियोजन, पाण्याचा वापर व विज निर्मिती याबाबत भारत सरकारने जी निती वापरली आहे त्यामध्ये मोलाचा वाटा आहे. डॉ. बाबासाहेबांनी शेतकऱ्यांच्या परिस्थितीबाबत विचार करताना त्यांच्या ही बाब निदर्शनास आली की देशपातळीवर पाण्याच्याबाबतीत एकवाक्यता नसून योग्य निर्णय घेणारी संस्था अस्तित्वात नाही. पाण्याबाबत राज्यांना मार्गदर्शन करणारे कोणतेही व्यवस्था नव्हती. डॉ. बाबासाहेबांच्या हेही लक्षात आले की, विद्युत निर्मिती, विद्युत वापर व तिचे वितरण याबाबतही मोठी समस्या असून याबाबत समन्वय साधनारी केंद्रीय संस्था कार्यरत नाही.

डॉ. बाबासाहेब आंबेडकर हे भारत सरकारात सन १९४२ ते १९४६ मध्ये मंत्री म्हणून कार्यरत असताना भविष्यातील भारताबाबत त्यांनी अनेक आराखडे कार्यान्वीत केले. या आराखडयात पाण्याचे धोरण, नियोजन, वितरण तसेच विद्युत निर्मिती व वितरण याचा समावेश होता.

सुचक शब्द : जलसिंचन, वीज व वीज निर्मिती, शेतकरी, शेती, पाणी, भूजल, धरणे, जल धोरण, बंधारे, सरकार, जमिन, नदी, शिक्षण.

I. **प्रस्तावना :** डॉ. बाबासाहेब आंबेडकर हे एक थोर अर्थतंज्ञ, समाजसुधारक व भारतीय राज्यघटनेचे शिल्पकार म्हणून ओळखले जातात. त्यांचे अर्थकारण राजकारण, समाजसुधारक म्हणून असलेले अष्टपैलू व्यक्तिमहत्त्व आपणा सर्वांना ज्ञात आहेत. त्यांनी भारतातील वंचित स्पृश्य-अस्पृश्य व बहुजन यांच्यसाठी केलेले कार्य फार मौल्यवान आहे. त्यांनी केलेल्या या कार्यासोबतच त्यांनी भारताच्या जल व विद्युत विकासासाठीची निती ही महनिय आहे. त्यांनी केलेल्या या कार्यामुळे ते भारताच्या आर्थिक नियोजनाचे जल व विद्युत नितीचे शिल्पकारही म्हणून ओळखले जातात.

II. **संशोधन पध्दती :** हा शोध निंबध लिहीतांना संशोधकाने दुय्यम स्त्रोताचा वापर केला आहे. यासाठी संदर्भ ग्रंथ, इंटरनेट यांचा आधार घेतलेला आहे.

संजय मोहन कुबल, उपकुलसचिव, शिवाजी विद्यापीठ, कोल्हापूर

संशोधनाचा उद्देश :

१. डॉ. बाबासाहेबांच्या शेतीविषयक व जलनिती विचारांचा आढावा घेणे.

२. भारतीय विद्युत व जल धोरणात डॉ. बाबासाहेब आंबेडकरांच्या विचारांचा अभ्यास करणे.

गृहितक : डॉ. बाबासाहेब आंबेडकर यांचे विद्युत व जलनिती विचार आजही देशाला मार्गदर्शक ठरतात.

III. **संशोधन प्रणाली :** प्रस्तुत संशोधनासाठी दुय्यम स्त्रोतांमार्फत माहितीचे संकलन करून दैनिक वर्तमानपत्रे, मासिके, पाक्षिके व इंटरनेवरील लेखांच्या आधारे सदर शोधनिबंध सादर केला आहे.

जल, जलसिंचन, वीज व वीज निर्मिती

डॉ. बाबासाहेब आंबेडकर यांनी जल व विद्युत विकास करण्यासाठी जल धोरण ठरविणे, त्याचे आर्थिक नियोजन, जलसंपत्तीचे संवर्धन, बहुउद्देश प्रकल्प, तांत्रिक प्रशासनाची निर्मिती, दामोदर खोरे प्रकल्प, हिराकुंड प्रकल्प, सोन नदी खोरे प्रकल्प, या सारख्या बहुउद्देशीय प्रकल्पाची पायाभरणी करून देशाच्या विकासाच्या चालनेची सुरूवात केली.

डॉ. बाबासाहेब आंबेडकर यांनी १९४० च्या सुरूवातीला जलसिंचन व विद्युतखात्याची जबाबदारी हाती घेवून जलसाधन सामग्री व विद्युत ऊर्जेच्या विकास धोरणांच्या रूपरेषांची आखणी केली. २० जूलै १९४२ रोजी डॉ. बाबासाहेब आंबेडकर हे मजूर मंत्री म्हणून कार्यरत झाले. त्यांच्याकडे श्रम, सिंचन, विज हे विभाग सोपविण्यात आले होते. त्यांनी १९४२ ते १९४६ या कालावधीमध्ये देशाचे आर्थिक नियोजनाचा पाया म्हणजे जल व विज धोरण आखले. भारताच्या आर्थिक विकासासाठी दळणवळण, रस्ते व विज हे घटक अंत्यत आवश्यक आहेत हे त्यांनी वेळोवेळी स्पष्ट केले.

डॉ. बाबासाहेब आंबेडकर यांनी कार्यकारी मंडळाचे व योजना समितीचे अध्यक्ष या नात्याने सिंचन व विज विभागाचे काम करताना सिंचन व वीजनिर्मीतीचा अभ्यास करून व त्यावर उपाय सुचविण्याचे बहुमोल काम केले.

जल व विद्युत धोरणांचे नियोजन

देशाचे दीर्घकालीन नियोजन व प्रकल्प हे आर्थिक विकासाच्या दृष्टीने महत्त्वाचे आहेत. त्यामध्ये संपूर्ण देशासासाठी कमीत कमी पंधरा ते पंचवीस किंवा त्यापेक्षा अधिक वर्षासाठी योजना बनविणे आणि अधिक विस्तारासह एका वेळी एकच टप्पा अशा प्रकारे पाच वर्षासाठी योजना, अशा सामान्य देशात मोठा भांडवली खर्च आणि विकासासाठी मूलभूत सेवासुविधांची निर्मिती करणाऱ्या क्षेत्राचा समावेश अशा दीर्घकालीन योजनेत केला. त्यामध्ये काही घटकांचा समावेश केला होता.

१. देशातील शेतीचा विकास होण्यासाठी जलसिंचन विकास, मृदेची होणारी झीजविरोधी उपाय, भू–सुधारणा पूरनियंत्रण व इतर उपायांयोजना करणे.

२. जल व विद्युत विकास करून शेती आणि उद्योग विकासासाठी तसेच उपसा सिंचन आणि ग्रामीण उद्योगांचा विकास करणे.

३. ग्रामीण भागात सर्वसमावेशक वाहतूक व दळणवळण सेवांचा विकास करणे.

डॉ. बाबासाहेब आंबेडकरांनी विकासाच्या या महत्त्वपूर्ण अंगाच्या दृष्टीकोणाचे निरिक्षण केले होते. धोरण समिती आणि त्यांच्या कार्यालयीन समितीचे महत्त्वाचे काम म्हणजे जलसिंचन आणि जलविद्युत शक्तीच्या विकासाशी संबंधित समस्यांचा अभ्यास करणे आणि त्या समस्येंचे आकलन करून त्या समस्या सोडविण्याचे उपाय सुचविणे. त्यांनी अशा समस्येवर सतत अभ्यास व चर्चा करून श्रमविभागाने प्रथमच नवीन जल व विद्युत धोरणाचा आराखडा तयार केला. नवीन जलधोरण व विद्युत धोरण आखताना सिंचन आणि ऊर्जाविकासासाठी श्रमविभागाने धोरणात्मक निवेदन तयार करून त्यामध्ये प्रामुख्याने खालील क्षेत्रांचा समावेश केला.

अ. सिंचन व जलमार्ग

शेती व औद्योगिक विकासाचे मूळ आधार म्हणजे जलसिंचन, जलमार्ग व जलविद्युतशक्तीचा विकास याबाबींच्या आधारे डॉ. बाबासाहेबांनी काही धोरणात्मक गोष्टी स्पष्ट केल्या.

१. राज्य शासनाने प्रामुख्याने नाल्यासंदर्भातीक उपाययोजना, सिंचन व जलमार्ग यांचे नियोजन आणि त्याची अंमलबजावणी हे कार्य करावे. केंद्र सरकारनेआवश्यक त्या सर्व साधनांचा प्रामुख्याने पुरवठा करण्याची व्यवस्था करावी.व आवश्यक तांत्रिक साहाय्य पुरविण्याची व्यवस्था करावी.

२. केंद्र सरकारने आवश्यकते व शक्य तेथे प्रादेशिक पातळीवर प्रांत व राज्यसाठी प्रकल्प तयार करून त्यासाठी लागणारे वित्तीय साहाय्य पुरवावे

३. जलमार्गांच्या कार्यासाठी केंद्र सरकारने 'अभियांत्रिकी सल्लागार' तसेच सिंचनकार्यासाठी 'विकास अधिकारी' नियुक्त करून प्रांत व राज्यांकडून प्रांत देशातील प्रकल्पांचे प्रस्ताव अंतिम करावेत.

४. अस्तित्वात असलेला केंद्रीय जलसिंचन मंडळाची अधिक परिणामकारकरीत्या कार्य करण्यासाठी पुनर्रचना करून सर्व जलसंबंधीच्या मुद्यावर सदर मंडळ कार्यवाही करील.

ब. विद्युतशक्तीचा विकास

विद्युतशक्तीचा विकास चांगल्या व विकासाच्या दिशेने करताना जे अडथळे येतात त्याकडे लक्ष ठेवणे आवश्यक आहे. देशातील विद्युतनिर्मिती आणि त्याचे वितरण हे कार्य धोरणात्मक नवेदनानुसार राज्य किंवा राज्यासारख्या उपक्रमांकडेच ठेवली जातील. असे डॉ. बाबासाहेब आंबेडकरांनी स्पष्ट केले आहे. त्यांनी इतर काही धोरणात्मक निर्णय खालीलप्रामाणे मांडले आहेत.

१. विद्युत धोरणातील मुदतीचा विचार करताना देशातील काही प्रमुख विद्युतविकास संस्थांना जास्तीची अत्युच्च उपकरणे, त्यांच्या उत्पादनक्षमतेनुसार, वितरित करण्याची खात्री किंवा त्याबाबतची सुरक्षितता

सरकारने देणे गरजेचे आहे. डॉ. आंबेडकरांच्या मते संपूर्ण भारतासाठी केंद्रस्थानी कार्य करण्याऱ्या 'केंद्रीय तांत्रिक शक्ती मंडळ' स्थापन करण्यात येईल.

२. या धोरणात रासायनिक खते करणारे कारखाने, उद्योगधंद्यांसाठी विद्युतशक्तीचा वापर करण्यात आला.

३. संपूर्ण देशासाठी विद्युतशक्तीच्या निर्मितीत मोठया प्रमाणात वाढ करणे, व्यावसायिक, प्रशासकीय आणि तांत्रिकवर्गाला त्यांच्या कार्यात प्राविण्य मिळविता यावे यासाठी विद्युतशक्ती उपक्रमांच्या प्रशिक्षणाची सोय करणे.

क. अंतर्गत जलवाहतूक.

जल व विद्युत विकासासाठी अंतर्गत जलवाहतूक ही महत्त्वाची आहे.अंतर्गत जलमार्गाच्या विकासासाठी धोरणात्मक निवेदनानुसार पुढील उपाययोजना स्पष्ट केल्या आहेत.

१. नदीतील जलमार्गामधील नौकानयन योग्य सुधारित उपाययोजना करणे.

२. अंतर्गत जलवाहतुकीसाठी सिंचन कालव्यांचा वापर शक्य तेथे करणे.

३. आधुनिक किंवा नवीन कृत्रिम जलमार्गाची निर्मिती करणे.

४. हाताने वल्हवण्याच्या नौका, आगबोट व शक्तीसाधनांवर चालणाऱ्या मोठया जहाजांचा वापर करणे.

५. सर्व प्रकारच्या जलवाहतूकीचे नियोजन.

धोरणाचे इतर मुख्य मुद्दे

जल व विद्युत विकासाच्या धोरणाचे मुख्य मुद्दे मांडण्यात आले आहेत.

१. नदीखोरे प्राधिकरण संकल्पनेची स्वीकार करून आंतरराज्य नदीवरील प्रकल्पाचे व्यवस्थापन आणि नियंत्रण करणे.

२. प्रादेशिक आणि बहुउद्देशीय संकल्पनेचा स्वीकार करून संपूर्ण नदीखोऱ्याच्या विकास करणे.

३. केंद्र शासनाने केंद्रस्थानी प्रशासकीय आणि तांत्रिक मंडळाची स्थापना केली पाहिजे.

विद्युत ऊर्जेचा विकास

एकापेक्षा अधिक राज्यांतून वाहणाऱ्या नद्यांच्या प्रकल्पावर प्रादेशिक नियंत्रणासाठी तसेच व्यवस्थापनासाठी कार्यकारी अधिकाराच्या नवीन साधनांचा विकास करणे. भारताला खात्रीशीर वीजपुरवठा हवा, स्वस्त वीजपूरवठा हवा आणि मुबलक वीजपुरवठा हवा असे डॉ. बाबासाहेब आंबेडकरांना वाटते. अशा इतर महत्त्वाच्या बाबीं त्यांनी पुढील प्रमाणे मांडल्या आहेत.

१. केंद्रामध्ये वीजपुरवठा विभागाची आवश्यकता आहे की नाही ही पडताळून पाहणे. तसेच वीजपुरवठा विभाग ऊर्जामार्गांची पाहणी करून वजीनिर्मिती वाढीसाठी योग्य मार्ग व त्यासाठी लागणारी तंत्रे स्पष्ट केली पाहिजेत. त्यासाठी लागणारा कोळसा, पेट्रोल, अल्कोहोल आणि वाहत्या पाण्याचा ऊर्जास्त्रोताचा अभ्यास करणे.

२. उपलब्ध ऊर्जेचा योग्य व कार्यक्षम वापर झाला पाहिजे यासाठी ऊर्जास्त्रोत आणि यंत्रसामग्री यांचा अभ्यास करण्यासाठी ऊर्जा संशोधन केंद्र ही केंद्र सरकारने स्थापन करावी असा विचार करणे.

३. भारत सक्षमक करण्यासाठी काही भारतीय तंत्रज्ञांना वीज तंत्रज्ञानाचे प्रशिक्षण देऊन वीज प्रकल्पाची उभारणी, देखभाल, विकास या बाबी विचारात घेणे आवश्यक आहेत.

बहुउद्देशीय प्रकल्प

एखाद्या खोऱ्यातील उपलब्ध संसाधनांचा अभ्यास करून त्या खोऱ्याचा सर्व दृष्टींनी विकास करणे म्हणजे बहुउद्देशीय प्रकल्प होय. डॉ. बाबासाहेब आंबेडकरांनी भारतात प्रथमच १९४५-४७ मध्ये दामोदर खेरे आणि महानदी खोरे यांच्या बहुउद्देशीय विकासासाठी खोऱ्यानुसार योजना पुढे आणल्या. १९४८ मध्ये भारतीय संसदीय लोकसभेने 'दामोदर नदी आणि तिच्या उपनदीवर खोरे' यांचा समावेश असणारा 'दमोदर व्हॅली' या नावाने कायदा करून बिहार व पश्चिम बंगालमध्ये दामोदर खोरे प्राधिकरण स्थापन केले. अशा प्रकारे डॉ. बाबासाहेब आंबेडकर आणि त्यांच्या विभागाने १९४४-४६ मध्ये दामोदर, महानदी, सोन आणि इतर नद्यांच्या खोरे प्रकल्प, बहुउद्देशीय नदी-खोरे प्रकल्प विकासावर भर देण्यात आला.

भारत सरकारने देशाच्या जलसंपत्तीच्या खात्रीपूर्वक उत्कृष्ट वापरासाठी प्राथमिक टप्पा म्हणून केंद्रीय तांत्रिक ऊर्जा मंडळ व केंद्रीय जलमार्ग, जलसिंचन, नौकानयन आयोग या केंद्रीय संघटना निर्माण करण्यात आल्या. बहुउद्देशीय प्रकल्पामध्ये खालील प्रकल्पांचा समावेश होतो.

१. दामोदर खोर प्रकल्प

बहुउद्देशीय पाण्याचा साठा आणि नदी खोरे प्राधिकरणाच्या संकल्पनेचा स्वीकार करून आंतरराज्यीय नद्यांचा विकास करण्याचा सर्वात चांगला मार्ग ठरला होता. डॉ. बाबासाहेब आंबेडकर हे भारताच्या वतीने काम करणारे व दामोदर नदी प्रकल्पाच्या विकासाचे आधारस्तंभ होते. दामोदर नदीचा उगम बिहारमध्ये झाला. बिहारमध्ये दामोदर नदीचा प्रवाह अत्यंत वेगवान, तीव्र व जलद आहे. दामोदर नदी ही हंगामी नदी आहे. पावसाळ्यात नदीचा प्रवाह जोरात असतो तर उन्हाळ्यात पाण्याची पातळी एकदम कमी प्रमाणात असते. ही नदी नैसर्गिक विध्वंसक प्रवृत्तीची आहे त्यामुळे या नदीला 'दु:खाची नदी' म्हणून संबोधले जाते. ही नदी बिहारमध्ये जमिनीची झीज करते तर पश्चिम बंगालमध्ये पुरामुळे गंभीर समस्या निर्माण होतात.

दामोदर नदीमुळे १९०७, १९०९, १९११ मध्ये महाभंयकर पुर आला तेव्हा काही उपाययोजना राबविल्या होत्या पण त्यामुळे १९१३ च्या महाभंयकर पुरामुळे परिस्थिती अत्यंत गंभीर झाली होती. दामोदर नदीमुळे अनेक गावांना

पूरांचा त्रास सहन करावा लागला. कितेक गावे उद्ध्वस्त झाली, रेल्वे लाईन्स तुटल्या होत्या. वाहतुकीची सोय वेगळया मार्गाने करावी लागली होती. अशा अनेक समस्यांना त्यांना तोंड द्यावे लागले होते. मध्यवर्ती सरकार, बंगाल आणि बिहार सरकारचे प्रतिनिधींची ३ जानेवारी १९४५ रोजी दमोदर प्रकल्पावर चर्चा करण्यासाठी बैठक झाली होती. डॉ. बाबासाहेब आंबेडकरांनी जलमार्गाच्या विकासासाठी सर्वंकष भारतीय धोरणाचा अभाव आहे हे स्पष्ट केले. जलमार्ग धोरण हे बहुउद्देशीय धोरणामध्ये जलसिंचन, जलविद्युत आणि नौकानयन यांचा समावेश असावा. बहुउद्दशीय खोरे प्रकल्पामध्ये विद्युतनिर्मिती होईल, जलसिंचनासाठी पाणी उपलब्ध होईल, त्याचप्रमाणे नौकानयनाच्याही सुविधा उपलब्ध होतील. डॉ. बाबासाहेबांनी घटनात्मक प्रनांची व अडचणींची जाणीव करून दिली. पहिल्या परिषदेमध्ये दोन बाबींवर सहमती झाली. त्यामध्ये

१. दमोदर नदी विकासासाठी बहुउद्देशीय सर्वंकष उपक्रम राबवून पूरनियंत्रणाला प्राधान्य देणे.

२. बहुउद्देशीय योजनांसंबधीचे प्राथमिक निवेदन तयार करून मध्यवर्ती तांत्रिक उर्जा मंडळाच्या मार्गदर्शनाखाली आणि नियंत्रणाखाली सर्वेक्षण आणि तसेच संशोधन करणे.

त्यानंतरची परिषद २३ ऑगस्ट १९४५ रोजी कलकत्ता येथे भरविण्यात आली. या परिषदेमध्ये तिलैया आणि मैथान धरणानंतर कोठार, बोकारो आणि पंचम येथे धरणे बांधण्यासाठी डॉ. बाबासाहेबांनी प्रोत्साहन दिले. त्यानंतर दामोदर खोरे प्रधिकरण मंडळाचे बिल भारताच्या लोकसभेत १ डिसेंबर १९४७ रोजी मांडले होते आणि १८ फेब्रुवारी १९४८ रोजी ते बिल पास करण्यात आले. २७ मार्च १९४८ रोजी गव्हर्नर जनरलची त्याला मान्यता मिळाली. सर्व पातळीवर डॉ. बाबासाहेबांच्या नेतृत्वामुळे दामोदर खोरे प्रकल्पाला चांगली गती मिळाली.

२. हिरांकुड प्रकल्प

महानदी ही ओरिसामधील सर्वात मोठी नदी आहे. या नदीच्या महापुरामुळे जुलै–ऑगस्ट १९४३ मध्ये फार मोठया प्रमाणात हानी झाली होती. ओरिसातील नद्यांच्या विकासासाठी ८ नोव्हेंबर १९४५ रोजी हिरांकुड परिषद भरविण्यात आली होती. या परिषदेमध्ये भारत सरकार, ओरिसा सरकार, प्रांतीय सरकार आणि पूर्वेकडील राज्यांचे प्रतिनिधी उपस्थित होते. या परिषदेचे अध्यक्ष डॉ. बाबासाहेब आंबेडकर होते. ओरिसातील सरकार आणि इतर संबंधित राज्यांच्या मदतीने मध्यवर्ती जलमार्ग, जलसिंचन आणि नौकानयन आयोगाचे सर्वेक्षण केल्यानंतर योजनेची रूपरेषा तात्पुरत्या स्वरूपाची आखण्यात आली. या योजनेमध्ये खालील बाबींचा समावेश करण्यात आल्या आहेत.

१. महानदीच्या मुख्य प्रवाहावर तीन कालवे बांधावेत त्यामुळे मान्सून हंगामात अतिरिक्त पाण्याचा साठी साठविला जाईल. तसेच पूरनियंत्रण होऊन बिगरमान्सून कालावधीमध्ये जलसिंचन, नौकानयन आणि विद्युतनिर्मितीसाठी कालव्यामधून पाणी सोडले जाईल.

२. दोन कालव्यांमध्ये जलवाहतूक लॉक खोली बांधण्यात यावी की ज्यामुळे महानदीवरील नौकानयनाच्या सुविधा साधारपणे ५०० किलोमीटरपेक्षा जास्त मार्गावर उपलब्ध होतील.

३. बारमाही जलसिंचनासाठी कालव्याची निश्चित पध्दती विकसित केली जाईल.

४. तिन्हीही कालव्यांच्या ठिकाणी ऊर्जाकेंद्र विकसित केल्यामुळे शेतीला आणि उद्योगाला स्वस्त दराने वीज उपलब्ध होईल. तसेच या भागातील खनिज साधनसंपत्तीचा पूर्ण वापर होईल.

५. सांडपाणी व्यवस्था विकसित केली जाईल.

६. संबलपूरच्यावर १५ किलोमीटरवर हिराकुंड,२५० किलोमीटर खालच्या बाजूला टिकारपारा आणि कटकजवळ निरज या तीन ठिकाणी कालव्याच्या जागा निश्चित केल्या आहेत. की ज्यामुळे मनोरंजनासाठी आणि मत्स्योद्योगासाठी सुविधा उपलब्ध होतील.

स्वातंत्र्यप्राप्तीनंतर म्हणजेच २८ ऑगस्ट १९४७ रोजी ओरिसा विधानसभेत हिराकुंड धरण प्रकल्पाच्या बाबतीत एकमताने ठराव पास झाला. हिराकुंड धरणाचे काम १९५७ मध्ये पूर्ण झाले होते.

३. सोन नदी खोरे प्रकल्प

सोन नदीचा उगम मध्यप्रदेशात झाला. ही नदी मध्यप्रदेशातून वाहत गंगेला मिळते. जलसिंचन, वीजनिर्मिती, कूपनलिकांना वीजपुरवठा, औद्योगिक विकासाला वीजपुरवठा, जलवाहतुकीस पाणीपुरवठा व पूरनियंत्रण असे फायद्यामुळे बहुउद्देशीय प्रकल्प विकसित होईल. संयुक्त प्रांत व बिहार, मध्यप्रांत आणि चंदभाकर, कोरला, सरगुजा, जेशपूर, माहीर यासारख्या प्रांतांना या प्रकल्पाचा प्रत्यक्ष लाभ मिळणार होता. तसेच बंगाल प्रांतांस गंगा नदीच्या जलवाहतूकीचा फायदा होणार होता.

दिल्ली येथे १० मार्च १९४५ रोजी सोन नदी प्रकल्पाशी संबंधित चर्चेसाठी बैठक घेण्यात आली होती. या परिषदेमध्ये भारतातील जलवाहतुक किती महत्त्वाची आहे हे मांडण्यात आले. डॉ. बाबासाहेब आंबेडकर यांनी स्थानिक दृष्टीकोनापेक्षा प्रादेशिक दृष्टीकोन स्वीकारल्यास व आर्थिक विकासात हा प्रकल्प किती महत्त्वाचा आहे हे स्पष्ट केले. त्यामध्ये त्यांनी काही महत्त्वाची वैशिष्ट स्पष्ट केली आहेत.

१. सोन नदी आणि तिच्या उपनद्यांचे पाणी याबाबतचे पूर्ण अधिकार या प्राधिकरणाला प्रांत व राज्यांनी दिले पाहिजेत.

२. प्राधिकरणाच्या जागेत वीजनिर्मिती करण्याचा संपूर्ण अधिकार प्राधिकरणास देऊन यास प्रात व राज्यांनी परवानगी दिली पाहिजे.

३. प्राधिकरणाच्या मान्यतेशिवाय पाणी वापरता येणे शक्य नाही याला प्रांतीय राज्यांनी मान्यता दिली पाहिजे.

४. जेथे धरण बांधले जाणार असेल त्या राज्यांच्या पाण्याखाली जाणाऱ्या जागेबाबत राज्य व प्रांतांनी निर्धारित अटीस मान्याता दिली पाहिजे.

अशा प्रकारचे प्राधिकरण हे केंद्र शासनामार्फत स्थापन करणे आवश्यक होते. धरण बांधण्यास व त्या पाण्याच्या व्यवस्थापनास प्रांतांनी व राज्यांनी करारामार्फत मान्यता दिल्या पाहिजेत.

नदीतून उपलब्ध होणारा जलसाठा सिंचनासाठी, जलविद्युत निर्मितीसाठी, जलवाहतुकीसाठी, औद्योगिक व शहरी वापरासाठी, उपसासिंचन योजनांसाठी अशा अनेक बाबींसाठी वापरणे ही बहुउद्देश प्रकल्पाची संकल्पना आहे. प्रादेशिक विकास करण्यासाठी औद्योगिकीकरणाची योजना निश्चित करणे, सामाजिक कल्याण करणे, वनीकरण करणे, रस्ते व शाळांचा विकास करणे, लोकसंख्येचे पुनर्वसन करणे, जलसिंचनात वाढ करणे, त्यासाठी लागणारे सहकारी पाणी योजना किंवा उपसा सिंचन योजना तयार करणे, खते व शेतीविषयक प्रदर्शने आयोजित करणे, नगरपालिका विकास मंडळे स्थापन करणे या बाबींचा समावेश असतो. सोन परिषद ही पथदर्शक ठरली.

केंद्रीय ऊर्जा मंडळाची स्थापना

भारतातील केंद्र व राज्यांना धरणे, पाटबंधारे ठरविण्यासाठी तांत्रिक आयोगाच्या स्थापनेची आवश्यकता भासू लागली. देशाचा सार्वजनिक वीजपुरवठयाचा विकास करण्यासाठी केंद्रीय स्तरावर एक तांत्रिक समिती स्थापन करण्याचा निर्णय घेण्यात आला. त्या मंडळाची स्थापना ८ नोव्हेंबर १९४४ रोजी करण्यात आली. या मंडळाद्वारे देशातील सार्वजनिक पाटबंधारे व ऊर्जा शक्ती विकासाचा आराखडा तयार करून सर्व्हेक्षण करणे व ऊर्जा विभागाच्या मदतीने वेगवेगळया योजना तयार करणे आशी अनेक कार्य ठरविण्यात आली.

कायद्यामध्ये पाण्याचे महत्त्व

डॉ. बाबासाहेब आंबेडकरांनी जल व विद्युत विभागाचे १९४२ ते १९४६ मध्ये मजूर मंत्री असल्यामुळे त्यांना पाण्यासंबंधीच्या, अगदी छोटया सुध्दा समस्या अवगत होत्या. डॉ. बाबासाहेब आंबेडकर हे घटना मसुदा समितीचे अध्यक्ष असताना भारतामध्ये १९३५ च्या कायद्यांच्या आधारे राज्यांची निर्मिती करण्यात आली. नदी मंडळ कायद्यानुसार आंतरराज्य नद्या व खोरे यांचे नियंत्रण आणि विकास करण्यासाठी नदीमंडळांना मान्यता घटक ५६ नुसार मिळण्यास सुरूवात झाली. आपल्या घटनेमध्ये ही तरतू कलम २६२ मध्ये समाविष्ट करण्यात आली.

शासनाचे जल व विद्युत या मूलभूत गरजांच्या विकासासाठी खालीलप्रमाणे कार्य हाती घेतली.

१. शासनाने भारतातील पाण्याचे नियोजन, पाण्याचा वापर व जलविद्युत प्रकल्प तयार करणे.

२. तांत्रिक मार्गदर्शन करण्यासाठी एक समिती स्थापन केल्यामुळे जलविद्युत प्रकल्प व पाटबंधारे यांचे कार्य वेगाने करता येईल.

३. संपूर्ण देशात पाण्याचे व्यवस्थापन, वाटप व वापर करण्यासंबंधी कोणतेही मार्गदर्शक तत्त्वे त्यावेळी नसल्यामुळे राज्यांमधील नद्यांद्वारे जलनिती आणणे हे त्यांचे उद्दीष्ट होते.

४. आपल्या देशाला राष्ट्रीय जलनिती, नद्या व जल खोरे यामधून पाण्याचे नियोजन यांची किती आवश्यकता आहे हे स्पष्टपणे नमूद केले.

५. दामोदर खोरे योजना, सोने नदी खोरे, ओरिसा नदी खोरे, शिवाय महानदी आणि चंबल या काही लहान मोठया नद्यांचा नदी खोऱ्यांचे प्रकल्पात समावेश होता.

तक्ता क्र. १

अ. क्र.	जल विद्युत केंद्रांची नावे	स्थापित क्षमता (मे. वॅ)
१	वैतरणा	६०
२	येलदरी	२२.५०
३	वीर	९
४	राधानगरी	४.८०
५	भाटघर	१६
६	पैठण	१२
७	पनशेत	८
८	तिल्लारी	६६
९	भिरा (पुच्छ) (टेलरेस)	८०
१०	पवना	१०
११	वैतरणा धरण	१.५०
१२	कन्हेर	४
१३	वरसगांव	८
१४	भातसा	१५
१५	धोम	२
१६	उजनी	१२
१७	माणिकडोह	६
१८	डिंभे	५
१९	वारणा	१६
२०	तेरवान मेढे	०.२
२१	सूर्या	६
२२	दूधगंगा	२४
२३	भडंरदरा १	१०
२४	भडंरदरा २	३४

(जल विद्युत केंद्राची यादी, वीकीपीडीया)

डॉ. बाबासाहेब आंबेडकरांनी जी जलनिती मांडली होती त्या जलनीतीच्या वापरामुळे भारतात सिंचन क्षमतेमध्ये कशा प्रकारे वाढ झाली याची खालील तक्त्याच्या आधारे स्पष्टता होते.

भारतातील विविध पंचवार्षिक योजना कालखंडातील सिंचनाचा विकास– (दशलक्ष हेक्टर)

(तक्ता क्र. २) : डॉ. बाबासाहेब आंबेडकर यांच्या कालखंडातील सिंचन विकास

योजना	सिंचन क्षमता					सिंचन क्षेत्र				एकूण
	मोठे व मध्यम सिंचन प्रकल्प	लघुसिंचन योजना			एकूण	मोठे व मध्यम सिंचन प्रकल्प	लघुसिंचन योजना			
		भूपृष्ठीय जल	भूगर्भीय जल	एकूण			भूपृष्ठीय जल	भूगर्भीय जल	एकूण	
योजना पूर्व ते १९५१	९.७०	६.४०	६.५०	१२.९०	२२.६०	९–७०	६–४०	६–५०	१२–९०	२२–६० (१००)
पहिली पंचवार्षिक योजना (१९५१–१९५६)	१२.२०	६.४३	७.६३	१४.०६	२६.३६	१०–९८	६–४३	७–६३	१४–०६	२५–०४ (९५–३५)

(तक्ता क्र. ३) : डॉ. बाबासाहेब आंबेडकर यांच्या कालखंडानंतरचा सिंचन विकास

योजना	सिंचन क्षमता					सिंचन क्षेत्र				एकूण
	मोठे व मध्यम सिंचन प्रकल्प	लघुसिंचन योजना			एकूण	मोठे व मध्यम सिंचन प्रकल्प	लघुसिंचन योजना			
		भूपृष्ठीय जल	भूगर्भीय जल	एकूण			भूपृष्ठीय जल	भूगर्भीय जल	एकूण	
दुसरी पंचवार्षिक योजना (१९५६–६१)	१४.३३	६.४५	८.३०	१४.७५	२९.०८	१३.०५	६.४५	८.३०	१४.७५	२७.८० (९५.३५)
तिसरी पंचवार्षिक योजना (१९६१–६६)	१६.५७	६.४८	१०.५२	१७.००	३३.५७	१५.१७	६.४८	१०.५२	१७.००	३२.१७ (९५.८२)
वार्षिक योजना (१९६६–६९)	१८.१०	६.५०	१२.५०	१९.००	३७.१०	१६.७५	६.५०	१२.५०	१९.००	३५.७५ (९६.३६)
चौथी पंचवार्षिक योजना (१९६९–७४)	२०.७०	७.००	१६.५०	२३.५०	४४.२०	१८.३९	७.००	१६.५०	२३.५०	४१.८९ (९४.७७)
पाचवी पंचवार्षिक योजना (१९७४–७८)	२४.७२	७.५०	१९.८०	२७.३०	५२.०२	२१.१६	७.५०	१९.८०	२७.३०	४८.४६ (९३.९५)
वार्षिक योजना (१९७८–१९८०)	२६.७१	८.००	२२.००	३०.००	५६.६१	२२.६४	८.००	२२.००	३०.००	५२.६४ (९२.९८)
सहावी पंचवार्षिक योजना (१९८०–८५)	२७.७०	९.७०	२७.८२	३७.५२	६५.२२	२३.५७	९.०१	२६.२४	३५.२५	५८.८२ (९०.१८)

सातवी पंचवार्षिक योजना (१९८५-९०)	२९.९२	१०.९९	३५.६२	४६.६१	७६.५३	२५.४७	९.९७	३५.६२	४३.१२	६८.५९ (८९.६२)
वार्षिक योजना (१९९०-९१)	०.८२	०.४७	३.२७	३.७४	४.५६	०.८५	०.३२	३.२७	३.४२	४.२७ (९३.६४)
१९९१-९२ च्या शेवटी	३०.७४	११.४६	३८.८९	५०.३५	८९.०९	२६.३१	१०.२९	३८.८९	४६.५४	७२.८५ (८९.८३)
आठवी पंचवार्षिक योजना (१९९२-१९९७)	३२.९६	उ.ना.	उ.ना.	५६.६०	८९.५६	२८.४४	उ.ना.	उ.ना.	५२.३२	८०.७६ (९०.१७)
नववी पंचवार्षिक योजना (१९९७-२००३)	९.८१	उ.ना.	उ.ना.	७.२४	१७.०५	८.७१	उ.ना.	उ.ना.	४.९२	१३.६३ (७९.९४)
१९९७-२००० दरम्यान	२.३९	उ.ना.	उ.ना.	२.७८	५.१७	२.०३	उ.ना.	उ.ना.	१.९१	३.९४ (७६.२०)
१९९९-२०००	३५.३५	उ.ना.	उ.ना.	५९.३८	९४.७३	३०.४७	उ.ना.	उ.ना.	५४.२३	८४.७० (८९.४१)

(भारत सरकार, २००४, ॲन्युअल रिपोर्ट, मिनिस्ट्री ऑफ वॉटर रिसोअर्सेस, वॉटर रिलेटेड स्टॅटिस्टीक्स)

(तक्ता क्र. ४) : योजनानिहाय विजनिर्मिती दर्शविणारा तक्ता

योजना	लक्ष (मे.वॅ)	प्राप्ती (मे.वॅ)	टक्केवारी	तूट
१ली पंचवार्षिका योजना (१९५१-५६)	१३००	११००	८४.६	१५
२री पंचवार्षिका योजना (१९५६-६१)	३५००	२२५०	६४.३	३६
३री पंचवार्षिका योजना (१९६१-६६)	७०४०	४५२०	६४.३	३६
४थी पंचवार्षिका योजना (१९६९-७४)	९२६४	४५७९	४९.५	५०
५वी पंचवार्षिका योजना (१९७४-७९)	१२४९९	१०२२६	८१.६	१९
६वी पंचवार्षिका योजना(१९८०-८५)	१९६६६	१४२२६	७२.३	२८
७वी पंचवार्षिका योजना(१९८५-९०)	२२२४५	२१४०१	९६.२	४
८वी पंचवार्षिका योजना(१९९२-९७)	३०५३८	१६४२३	५३.८	४६
९वी पंचवार्षिका योजना(१९९७-०२)	४०२४५	१९०१५	४७.५	५३
१० वी पंचवार्षिका योजना(२००२-०७)	४१११०	२१२८०	४८.२	५२
११वी पंचवार्षिका योजना(२००७-११)	७८५७७	--	--	--

(Business and Economic facts for you, P. 8)

(तक्ता क्र. ५) : डॉ. बाबासाहेब आंबेडकर यांच्या काळातील धरणांची स्थापना

अ. क्र.	धरणे	स्थापना	नदी	ठिकाण
१	मुल्लापेरियार धरण	१८९५	पेरियार	इडुक्की, केरळ
२	भंडारदरा धरण	१९२६	प्रवरा	अकोला,महाराष्ट्र
३	मूळशी धरण	१९२७	मूळा	पूणे, महाराष्ट्र
४	निझम सागर धरण	१९३१	गोदावरी	कामारेड्डी, तेलगंना
५	बसव सागर धरण	१९३२	कृष्णा	यदागीरी, कर्नाटक
६	मेटूर धरण	१९३४	कावेरी	सलेम, तमिळ नाडू
७	कृष्णा राजा सागर धरण	१९३८	कावेरी	मध्य कर्नाटक
८	तुंगभद्रा धरण	१९५३	तुंगभद्रा	बल्लारी, कर्नाटक
९	राधानगरी धरण	१९५४	भोगावती	कोल्हापूर, महाराष्ट्र
१०	भवानी सागर धरण	१९५५	भवानी	इरोड, तमिळ नाडू

(तक्ता क्र. ६) : डॉ. बाबासाहेब आंबेडकर यांच्या कालखंडानंतरची धरणांची स्थापना

अ. क्र.	धरणे	स्थापना	नदी	ठिकाण
१	नागार्जुन सागर धरण	१९६७	कृष्णा	गुंतूर (आंध्रप्रदेश), नलगोंडा (तेलगंना)
२	श्रीसाईलम धरण	१९६१	कृष्णा	कूरनूल,आंध्रप्रदेश
३	सोमसीला धरण	१९८९	पेणार	नेल्लोरे, आंध्रप्रदेश
४	धरोई धरण	१९७८	सांबरमती	मेहसना व सांबरकान्ता, गुजरात
५	दंतीवाडा धरण	१९६५	दंतीवाडा	बनासकान्ता, गुजरात
६	कडणा धरण	१९८९	माही	माहीसागर, गुजरात
७	सरदार सरोवर धरण	२०१७	नर्मदा	तपी, गुजरात
८	भाकरा धरण	१९६३	सतलज	बीलासपूर, हिमाचल प्रदेश
९	चामेरा धरण	१९९४	रावी	चांबा, हिमाचल प्रदेश
१०	नथप्पा झाकरी धरण	२००४	सतलज	शीमला, हिमाचल प्रदेश
११	पंदोह धरण	१९७७	बीस	मंदी, हिमाचल प्रदेश
१२	बगलीहर धरण	२००४	चेनाब	दोडा, जम्मू–काश्मीर

१३	दुमखार धरण	२००३	इंदूस	ल्हे, जम्मू–काश्मीर
१४	उरी धरण	२०१४	झेलूम	बरामूळा, जम्मू–काश्मीर
१५	चंदील धरण		सूबरनारेखा	सेंरैकेला खारसवन, झारखंड
१६	मैथॉन धरण	१९५७	बराकर	धनबाद, झारखंड
१७	पंचेत धरण	१९५९	दामोदर	छामोदर, झारखंड
१८	अलमट्टी धरण	२००५	कृष्णा	वीजापूर, कर्नाटक
१९	कदरा धरण	१९९७	कलीनादी	कारवार, कर्नाटक
२०	हरांगी धरण	१९८२	हरांगी	कूसाळनगर, कर्नाटक
२१	कोडसल्ळी धरण	२०००	काली	करवार, कर्नाटक
२२	बनसुरा सागर धरण		काबिनी	वायनाड, केरळ
२३	इडुक्की धरण		पेरियार	इडुक्की, केरळ
२४	वलयार धरण	१९६४	वलयार	पक्कड, केरळ
२५	नेयार धरण	१९५८	नेयार	तिरूअनंतपुरम, केरळ
२६	चेरूथोनी धरण	१९७६	पेरियार	इडुक्की, केरळ
२७	बाणसागर धरण	२००६	सोने	शहडोल, मध्य प्रदेश
२८	बर्गी धरण	१९८८	नर्मदा	ज्बलपूर, मध्य प्रदेश
२९	इंदिरासागर धरण	२००५	नर्मदा	मुंडी, मध्य प्रदेश
३०	राजघाट धरण	२००५	बेतवा	अशोक नगर (मध्य प्रदेश), ललितपूर (उत्तर प्रदेश)
३१	गांधी सागर धरण	१९६०	चंबळ	मंदसौर, मध्य प्रदेश
३२	खडकवासला धरण	१९६९	मुठा	पूणे, महाराष्ट्र
३३	कोळकेवाडी धरण	१९७५	कोयना	रत्नागिरी, महाराष्ट्र
३४	पानशेत धरण	१९७२	अंबी	पुणे, महाराष्ट्र
३५	जायकवाड धरण	१९७६	गोदावरी	औंरगाबाद, महाराष्ट्र
३६	हिराकुंड धरण	१९५७	महानदी	संबलपूर, ओडिसा
३७	इंद्रावती धरण	२००१	इंद्रावती	कलहांडी, ओडिसा
३८	बिसळपूर धरण	१९९९	बनस	टोंक, राजस्थान
३९	पेरूंचणी धरण		परलायर	कन्याकुमारी, तामिळ नाडू

४०	श्रीराम सागर प्रकल्प	१९७७	गोदावरी	निजामाबाद, तेलंगणा
४१	रिहंद धरण	१९६२	रिहंद	सोनभद्र, उत्तर प्रदेश
४२	टिहरी धरण	२०१८	भागीरथी	टिहरी, उत्तराखंड

(Cracku, 2018, Dam In India)

IV. निष्कर्ष :

१. डॉ. बाबासाहेब आंबेडकरांनी हाती घेतलेल्या कार्यामुळे देशाच्या विद्युत व जलयोजनेला चालना मिळाली.

२. डॉ. बाबासाहेब आंबेडकरांनी सुचविलेल्या उर्जामंडळांची स्थापना आजही कार्यरित आहे.

३. डॉ. बाबासाहेब आंबेडकरांनी सुचविलेल्या प्रमाणे घातला गेलेला तांत्रिक शिक्षणाचा पाया यामुळे आज २१ व्या शतकात तांत्रिक शिक्षणाच्या बाबतीत केलेल्या प्रगतीस पुरक ठरला आहे.

४. डॉ. बाबासाहेब आंबेडकरांनी सुचविलेल्या विज व जलनितीचे २१ व्या शतकात काटेकोर पालन केल्यास भारत विज व जल पुरवठा याबाबत उद्दीष्ट गाठू शकतो.

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4 Sustainability Through Participatory Watershed Development: Village level experiments in Vidarbha Region of Maharashtra

Dr. Pralhad M. Mane[1]

Abstract : The present research paper is devoted for describing the village level experiments in watershed development in Vidarbha Region consisting Amravati and Nagpur divisions. Amravati division here consists of Chikaldhara, Nandgaon, Pimpalgaon Bhahinai and Pimpalgain Nipani villages in Amravati district Hirangi Manglurpir and Jhamrun Mahali in Washim district and Shivani village in Buladhana district. From Nagpur division- there is Garamsur village from Wardha District. Thus, there are total eight villages out of which four villages are from Amravati district, two villages from Washim district and one each from Buladhana and Wardha districts. The location of village, how the people in village have taken Initiative for watershed development, people's opinion on watershed development Pre and post watershed development project situations have been discussed. Primary and Secondary data (available through books, journals and websites) have also been used.

Keywords: Poverty, community, rural economy, watershed, environment

I. INTRODUCTION-

The concept of Sustainable Development put forward in the report titled Our Common Future (1987) is: **'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: -the concept of "needs",** in particular the essential needs of the world's poor, to which overriding priority should be given; and -the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.' (Quoted from Science Age, 1987:30).

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In order to understand the meaning of the definition, let us understand the core issues addressed in the above definition. First is the issue of economic growth. The economic growth is considered essential for poverty reduction, and also for meeting human needs and aspirations for better life. Second is the issue of limitations of the environment's ability to meet the needs of the present and future generations. Due to the pressures generated by growing societal needs, societies are using modern technologies for extracting and utilizing natural resources, which are limited. If we continue to exploit already limited natural resources, future generations will not be able to meet their own needs. Thus, environment's ability to meet present and future generations' needs has certain limits. This realization is clearly reflected in the definition. Thus, the concept of "sustainable development" is based on an integrated view of development and environment; which recommends to pursue development strategies to maximize economic growth from a given ecological milieu on the one hand, and to minimize the risks and hazards to the environment on the other, for being able to meet the needs and aspirations of the present generation without compromising the ability to meet those of the future generations.

In short, above definition of sustainable development implies that: (i) we should direct our efforts towards redressing the damage already done to the environment by earlier unsustainable patterns of economic growth and, (ii) we should follow such a pattern of development which avoids further damage to the planet's ecosystem and ensures meeting of the needs of present as well as future human generations.

The UN Summit on Sustainable Development Goals (Total 17 SDGs) are a new, universal set of goals, targets and indicators that UN Member States will be expected to use to frame their agendas and political policies over the next 15 years up to 2030 for transform the world. With this backdrop the the participatory approach and management of watershed and the resources can achive the environmental sustainability as well as economic sustainability. With this backdrop the participatory approach and management of watershed and the resources can achive the environmental as well as socio-economic sustainability.

The participatory approach is based on some guiding principles like: - Poverty can be

alleviated and eradicated when people realize their creative potential, come together and organize themselves based on self-help and community objectives.

A watershed is not just a naturally occurring hydrological unit. It becomes necessary to draw the inhabitants together, generate a common interest and foster a common purpose.

Participatory and well-managed watershed development enhances the ecological resource base of a rural economy and creates sustainable livelihood opportunities for the watershed community.

A participatory approach involving the watershed community (village), NGOs and Technical Support Organizations, is necessary, as integrated watershed development involves a variety of skills, disciplines and competencies.

The coming together of people's initiative and supportive institutional and policy framework could create conditions favourable to the unfolding and establishment of a people's movement for environmental regeneration on watershed basis (https://water.tallyfox.com/groups/watershed-management/ blog/participatory-approach-watershed-development-developing-countries).

The World Development Report (1992), opined that projects are more successful if they are participatory in design and implementation. Involvement of people at all levels gives them a sense of ownership which in turn makes them accountable.

People's participation presumes following features:

1. Centrality of people is the essence of participation. Any programme should be based on felt needs of people.
2. People themselves should analyze their condition and propose the project.
3. Capacity building should be done to develop local capacity and mobilize local resources. People's potential can be increased by improving their capabilities through education, training and participation in developmental activities.
4. Indigenous technical knowledge, technique and local methods should be valued.

5. Marginalized classes must be associated and encouraged to participate actively.
6. Women should also be included as equal partners.
7. People should be taken into confidence that they are real planners and benefits will also accrue to them in short run and long run.
8. People must be associated in execution and monitoring also (Narwani G.S.2005, p. 20).

It has been noted that the Participatory Micro Watershed development helps to conserve and manage land and water on an area basis so that the basic needs of people (food, fodder, fuel, water and livelihood) are met in a sustainable and socially just manner (http://www.nmsadguru.org/ParticipatoryMicroWatershedDevelopment.html).

Watershed Development Programmes in India:

The importance has been given to dry farming in India, especially since the mid 1980 in order to combat the limited natural sources of water and to protect the land from degradation, conserve rainwater and improve the general economic condition of dry land farmers. In India, watershed development programme is taken up under various programmes launched by the Government of India. The Drought Prone Area Programme (DPAP) and Desert Development Programme (DDP), adopted watershed approach in 1987.The Integrated Watershed Development Board, National Watershed Programme in Rain fed Areas (NWPRA) under Ministry of Agriculture and Integrated Wastelands Development Programme in 1996 under Ministry of Rural Development and Employment. At present, on-going 4 Central schemes IWDP, DPAP, DDP and NWDPRA have been merged into a new scheme called Bhoomi Vikas Yojana under a common guideline (Guideline for Watershed Development, 1995 and revised in 2001) which envisages bottom-up approach. The main aim is to manage the land and water resources for sustained production. The watershed Development Programmes like DDP, Drought-Prone-Area-Programme (DPAP) and Integrated Wasteland Development Programme (IWDP) are implemented by the Zilla Panchayats through Watershed Associations. A Project Implementing Agency can be a Government Department or NGOs.

Both the Centre and State Governments have been making continuous and constant efforts to improve the living standards of rain fed farmers through planned programmes. These programmes were implemented by both Government Organisation (GOs) and Non-Government Organisations (NGOs). The focus is on giving technical support in watershed projects, mapping of project areas design and implementation guidelines for soil and water conservation structure like bunding, check dams, gully plugs, desiltation of tanks etc. The detailed planning and design for all soil and water conservation measures is done with the consultation of each subject matter specialist such as engineer, forester, agronomist, social scientist, etc, in the watershed development team. The Government of India has fixed the cost norm of watershed development, which is about Rs 6000/ha. (Kakade B.K.).

It is the recent policy response to the increasing environmental crises and non-sustainability of agriculture especially in dry land/semi-arid regions (Shah A.,2000 pp.3155-3164).

Watershed development Programme is also viewed as the key programme, which will meet the emerging and complex challenges of poverty in rain-fed areas, unemployment and acute degradation of natural resources. The concept of integrated and participatory watershed development and management has today emerged as the cornerstone of rural development in dry and semi-arid regions of India (Joy K., and Paranjape S. 2004).

The objectives of watershed development are far reaching and more comprehensive which involves developing the natural resource base, sustaining its productivity, improving the standard of living of millions of poor farmers and landless labourers and endeavoring for restoration of ecological balances (Kulkarni Seema, Ahmed Sara, Arya Swarnalata, Joy K.J., Paranjape Suhas, 2007 p. 57).

II. RESEARCH METHODOLOGY AND DATABASE-

Objective of the Study:

The main objective of the study is to document the successful village-level experiments carried out in watershed development in Vidarbha Region in Maharashtra.

Research Design : The descriptive research design has been used for the study.

The Study Area : The study has been carried out in Vidarbha Region in Maharashtra. **Villages Covered under the Study :** Total 08 village experiments covered under the Study. The census study of all 08 villages was done. Chikaldhara, Amravati, Nandgaon Khandeshwar Pimpalgaon Bahinai Pimpalgaon Nipani, (Amravati), Hirangi Manglurpir, Jhamrun Mahali, (Washim) Shivani, (Buladhana), and Garamsur (Wardha)

In these villages visits were made by the Co-Investigator and the field Assistants. The actual Project site was seen. The interview Schedule was prepared for four types of respondents which included: Grampanchayt Leaders and Government officials, Farmers, Landless labour and Women in the villages under Project.

Tools of data Collection :

The primary and secondary data has been used for the study. The secondary data has been collected through books, journals, pamphlets and websites etc. The primary data has been collected through interview of the key persons, farmers, landless labourer and women from the concerned villages. The photographs have been taken to get the visual presentation.

Data Processing and Analysis:

The primary data have been processed through SPSS available in the Dept. of Sociology under UGC-SAP-DRS-Phase III. The primary and secondary data have been edited, classified, tabulated in the light of the objectives of the study. Present paper is part of UGC Major research Project "Participatory Watershed Development: Village level experiments in Maharashtra"

III. RESULTS AND DISCUSSION:

The present research paper is devoted for describing the village level experiments in watershed development in Vidarbha Region consisting Amravati and Nagpur divisions. Amravati division here consists of Chikaldhara, Nandgaon, Pimpalgaon Bahinai and Pimpalgaon Nipani villages in Amravati district, Hirangi Mangiurpir and Jhamrun Mahali in Washim district and Shivani village in Buladhana district. From Nagpur division-there is Garamsur village from Wardha district. Thus, there are total eight villages out of which four villages are from Amravati district, two villages from Washim district

and one each from Buladhana and Wardha districts. The location of village, how the people in village have taken initiative for watershed development, people's opinion on watershed development, pre and post watershed development project situations have been discussed. The secondary data available through books, journals and websites have also been used.

1. Chikhaldara:

It is a hill station and a municipal council in Amravati district. Amravati to Chikhaldara distance is 85 km. Featured in the epic of the Mahabharata, this is the place where Bheema killed the villainous Keechaka in a herculean bout and then threw him into the valley. It thus came to be known as Keechakadara—Chikhaldara is its corruption. The sole hill resort in the Vidarbha region, it is situated at an altitude of 1118 m with highest vairat point 1188m and has the added dimension of being the only coffee-growing area in Maharashtra. Chikhaldara has an annual rainfall of 154cm. Temperatures vary from 39C in summer to 5C in winter. It abounds in wildlife, such as tigers, panthers, sloth bears, sambars, wild boar, and rarely seen wild dogs. Close by is the famous Melghat Tiger Project (https://en.wikipedia.org/ wiki/Chikhaldara) The population of Chikhaldara Municipal Council according to 2001 is 5128 (Male 2789 and Female 2369). Area is 3.94 Km2, density is 1309 Km2 Both the village covered in Chikaldhara hilly region.

Opinion about Positive Impact of Watershed Project:

a) **Farmer Name :** Mr. Pralhad laxmanji Patil- Increased water level, Solved water shortage problem.

b) **Agriculture Labor :** Mr. Ramu Belsara-Sufficient water available in Village,Increased farm production Wheat, Growth of trees.

c) **Female Labor :** Smt. Bhayala Kisan Bandare-Increased water.

Observations :

a) Problem of water shortage solved, b) Increased water level, c) Increased work for villagers, d) Wheat production increased, e) Increase in farm production, f) Work of CNB, MNB, and Compartment in hilly areas done under project, g) Tribal Population-

Korku, Bhill, Gond, h) Watershed work started since British period.

i) Work under Shivkalin Yojana-2011-12 Project of Government of Maharashtra

j) Watershed projects at Chikhaldara hilly area includes the bunds as follows: Motha-6, Shahapur-2, Aamzari-4, Jamliwan-10, Salona-6

2. Nandgaon Khandeshwar:

It is a Town in Nandgaon Kh. Taluka in Amravati District. It belongs to Vidarbha region. It belongs to Amravati Division. It is located 32 KM towards South from District headquarters Amravati. It is a Taluka head quarter. Nandgaon Kh Pin code is 444708 and postal head office is Nandgaon Khand Eshwar. Mokhad (4 KM) , Yenas (4 KM) , Rohana (5 KM) , Kani Mirzapur (6 KM) , Dhanora Gurav (8 KM) are the nearby villages to Nandgaon Kh. Nandgaon Kh is surrounded by Chandur Ril Taluka towards East, Ner Taluka towards South, Amravati Taluka towards North , Babhulgaon Taluka towards East . Amravati, Wadgaon Road , Yavatmal , Murtijapur are the nearby cities to Nandgaon Kh. This Place is in the border of the Amravati District and Yavatmal District (http://www.onefivenine.com/india/villages/Amravati/Nandgaon-Kh/Nandgaon-Kh).

As per 2011 census, total population of Nandgaon khandeshwar is 129,810. Male Population: 66,661 (51.35%) and Female Population63,149 (48.65%). Nandgaon khandeshwar literacy ratio of 86% with 99,742 total people literate. In terms of literacy, Nandgaon khandeshwar ranks at 11th in Amravati district, ranked 57th in Maharashtra

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Rajesh Mandlik-Increased water in village, Solved the problem of water shortage.

b) Agriculture Labor: Mr. Ravindra Maraotrao Fuse-Water level increased.

c) Female Labor: Smt. Ratnabai Maruti Mandalik:Water available to agriculture and drinking.

Observations:

a) Problem of water shortage still not solved completely, water gets stored only rainy season, b) Two big lakes built during British period and two during 1972 to 1982.

c) Rainfall is not since last four years, e) Tanker is still needed during summer season.

3 Pimpalgaon Bainai in Amravati District :

According to Census 2011 information the location code or village code of Pimpalgaon village is 533105. Pimpalgaon village is located in Nandgaon Khandeshwar Tehsil of Amravati district. It is situated 12km away from sub-district headquarter Mund Nishankrao and 33km away from district headquarter Amravati. As per 2009 stats, Pimpalgaon Bainai

is the gram panchayat of Pimpalgaon village. The total geographical area of village is 476.68 hectares. Pimpalgaon has a total population of 1,058 peoples (550Male and 508 Female). There are about 277 houses in Pimpalgaon village

The issue is that one needs confident community facilitators to build a confident watershed community. Participation remains a word with an elusive workable meaning. Most government agencies such as the Agriculture Department remain poor at even initiating participation. In fact, two villages out of six visited in Vidarbha had been earlier rejected by the Agriculture Department on the pretext that there was no cooperation from the village after it was taken up for watershed development. In one such village, Pimpalgaon Bainai, most villagers said that they were not even aware that their village had been taken up under the watershed development programme by the Agriculture Department. In contrast, at Bairwadi, where the project was also implemented by the Agriculture Department, good participation was noted from all strata of the community. (Book on Maharashtra by 4/5 authors) In the DPAP Project for Pimpalgaon Bahinai, Chandrapuri Maharaj Shikshan Prasarak Samstha has done contribution.

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Tushar Deshmukh-Solved water shortage problem, Sufficient water available, Increased water in wells, Growth of trees.

b) Agriculture Labor: Mr. Nandu Jagtap-Solved the problem of water shortage, Increased water in wells.

c) Female Labor: Smt. Jaya Dilip Sarode-Increased water due to farm ponds.

Observations:

a) Problem of water shortage completely solved, b) Growth of trees, c) Political leader Mr. Ajay Arvind Pandit worked for watershed development, d) Increase in farm production, e) Development of agriculture, f) Work by Chandrapuri Maharaj Shikshan Prasarak Mandal for watershed project, g) More than 20 farm ponds built up in village.


ग्रा.पं.कार्यालय पिंपळगांव(बैनाई.)

4. Pimpalgaon Nipani :

According to Census 2011 information the location code or village code of Pimpalgaon Nipani village is 533149. Pimpalgaon Nipani village is located in Nandgaon Khandeshwar Tehsil of Amravati district. It is situated 22km away from sub-district headquarter Mund Nishankrao and 73km away from district headquarter Amravati. As per 2009 stats, Pimpalgaon Nipani village is also a gram panchayat. The total geographical area of village is 756.56 hectares. Pimpalgaon Nipani has a total population of 1,604 peoples (Male 792 and Female 812). There are about 445 houses in Pimpalgaon Nipani village

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Suresh Baliram Dhavale-Increased water level.

b) Agriculture Labor: Mr. Gajanan Gangawane- Increased water in wells.

c) Female Labor: Smt. Shimabai Ganeshrao Dhavale- Up to some of level water problem solved.

Observations:

a) Problem of water shortage still not solved completely,

b) Increase in farm production,

c) People blame on work of projects regarding corruption.

5. Hirangi :

According to Census 2011 information the location code or village code of Hirangi village is 530732. Hirangi village is located in Mangrulpir Tehsil of Washim district. It is situated 15km away from sub-district headquarter Mangrulpir and 30km away from district headquarter Washim. As per 2009 stats, Hirangi is the gram panchayat of Hirangi village. The total geographical area of village is 370.4 hectares. Hirangi has a total population of 984 peoples (538 Male and 446 Female). There are about 251 houses in Hirangi village

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Ramdas Ramchandra Savake- Increased water level, Growth of trees.

b) Agriculture Labor: Mr. Digambar Uttam Savake-Increased water level.

c) Female Labor: Smt. Parubai Ramchandra Savake-Increased water level.

Observations :

a) Problem of water shortage solved completely, b) Continuity not seen in work.

c) No work in all seasons to villagers, e) Increased farm production, f) Work of Bund Bandisti at village, g) Farmers take Pulses production in village.

6. Jhambhrun Mahali :

According to Census 2011 information the location code or village code of Jambhrun Mahali village is 531212. Jambhrun Mahali village is located in Washim Tehsil of Washim

district. It is situated 18km away from sub-district headquarter Washim and 17km away from district headquarter Washim. As per 2009 stats, Jambhrun Mahali village is also a gram panchayat. The total geographical area of village is 334.55 hectares. Jambhrun Mahali has a total population of 1,675 peoples (Male 900 and Female 775). There are about 354 houses in Jambhrun Mahali village

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Sakharam Kisan Mane- Increased water in wells, Water available due to farm ponds, Growth of trees.

b) Agriculture Labor: Mr. Sanjay Ramkrishan Mahale-Solved the problem of water shortage, Increased water in wells, Growth of trees, Ideal Village Prize to village.

c) Female Labor: Smt. Laxmi Harikishan Mahale- Increased water water level.

Observations :

a) Problem of water shortage solved completely, b) Anna Hazare visited to village, villagers inspired by Anna Hazare, c) Political leader Mr. Pandurang Mahale, taken initiative for watershed project, d) Watershed work by MIT Pune, e) Increase in farm production, f) Work of CNB, MNB and farm ponds done under project, g) Ideal Village Prize to village, h) Environmental awareness increased within villagers.

7. Shivani (Taka) village in Buldhana District-

Shivani Taka is a village in Sindkhedraja Taluka in Buldhana District. It belongs to Vidarbha region. It belongs to Amravati Division. It is located 83 KM towards South

from District headquarters Buldhana. 19 KM from Sindkhedraja. Naiknagar (3 KM), Dhandarwadi (4 KM) , Anchali (4 KM) , Dawargaon (4 KM) , Waghora (5 KM) are the nearby villages to Shivani Taka. Shivani Taka is surrounded by D. Raja Taluka towards North , Jalna Taluka towards west , Mantha Taluka towards East , Jafrabad Taluka towards North . Jalna , Partur , Lonar , Mehkar are the nearby cities to Shivani Taka

Opinion about Positive Impact of Watershed Project:

a) Farmer: Mr. Mahmadd Emam Dargewale- Work under project not done properly.

b) Agriculture Labor: Mr. Samadhan Anna Kute- Increased water in wells. Growth of trees, Increased work for labourers.

c) Female Labor: Smt. Rukmini Ashok Tambekar- Sufficient water availability.

Observations:

a) 291 hectors land under irrigation due to project, b) Water level increased. c) Production increased compare to before project situation, d) Economic development, e) Forest increased, Project work by villagers.

8. Garamsur:

According to Census 2011 information the location code or village code of Garamsur village is 533874. Garamsur village is located in Seloo Tehsil of Wardha district. It is situated 43km away from sub-district headquarter Seloo and 60km away from district headquarter Wardha. As per 2009 stats, Garamsur is the gram panchayat of Garamsur village. The total geographical area of village is 811.46 hectares. Garamsur has a total population of 533 peoples (270Male 263 Female). There are about 132 houses in Garamsur village (https://villageinfo.in/maharashtra/ wardha/seloo/garamsur.html).

Opinion about Positive Impact of Watershed Project:

a) Farmer Name: Mr. Prakash Nagorao Ueke- Increased water level, Growth of trees.

b) Agriculture Labor: Mr. Pandurang Devrao Salam- Increased water in well.

c) Female Labor: Smt. Yogita Rameshwar Warkhade- Increased water level. Growth of Trees

Observations:

a) Village is under Bore Tiger Reserve Zone, b) Government given notice to leave the village within next two years to the villagers, so no continuity in watershed work, c) No work in all seasons to villagers, d) Work of CNB, MNB, and Compartment in hilly areas done under project, e) Work under Vasundhra project of Government f) Villagers living under tension due to frequent attacks by wild animals, g) Majority of population belongs to tribal community i.e. Gond.

IV. Concluding Remarks :

The environmental conservation through 'participatory watershed development' is emerging in some of the villages in Maharashtra which can be considered as village-level experiment. This scene can be termed as a model for sustainable development in rural areas. The overall review of the village level experiments of Vidrbha region shows that three trends have emerged. The documentation of the successful village-level experiments carried out in watershed development in Vidarbha has been done. The salient features of the villages particularly with reference to initiatives taken and people's participation were studied. There is a significant role of Government agencies, social workers, leaders and NGOs to mobilise the people in Watershed Development in these Villages. The overall situation of the people from different strata has improved considerably after the watershed development project. Through, participatory watershed development programme water availability can be ensured on Sustainable basis.

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5 कवी राजाभोज वर्णित– रामचरितातील विविध पैलू – एक अध्ययन

डॉ. अनिरूद्ध मंडलिक

निबंध सारांश (ABSTRACT)

साहित्यशास्त्रकारांनी ठरवून दिलेल्या पात्रलक्षणांच्या पद्धतीनुसार पात्रनिर्मिती हे उत्तमकाव्याचे लक्षण मानले जाते. संस्कृत साहित्यातील सर्वच कलाकृती कवींनी केलेल्या सुयोग्य पात्र संयोजनाने सर्वोत्तम झाल्या आहेत. याचे एक सर्वोत्तम उदाहरण म्हणजे वाल्मीकि रामायण. या ग्रंथात वाल्मीकींनी रामचरित्र रेाटले. राम हे संस्कृत साहित्यातील अजरामर व्यक्तिमत्त्व आहे. रामाचे वर्णन करीत असताना रामाचे साहित्यिक दृष्ट्याा वर्णन, तसेच जनमानसावर रामाचा व्यक्ती म्हणून पडलेला प्रभाव या दोन्ही बाबींचा विचार प्रत्येक कवीने केला आहे.

रामचरितावर मोहित होऊन इ.स.१०व्या शतकात चम्पू काव्यप्रकारात कवी भोजाने ही 'चम्पूरामायणम्' या संस्कृत ग्रंथाची रचना केली. गद्य व पद्य शैलीने युक्त हे काव्य असल्याने या काव्याला चम्पू ही संज्ञा केलेली आहे. विश्वनाथाने चम्पूकाव्याची '**गद्यपद्यमयं काव्यं चम्पूरित्यभिधीयते।**' (साहित्यदर्पण. ६/३३६) अशी व्याया केली आहे. (सिंग.१९५७, पा.नं. ५५८)

विविध रामकथाश्रित काव्यांचा प्रभाव 'चम्पूरामायणम्' या ग्रंथावर आहे, परंतु भोजाने महर्षी वाल्मीकींच्या काव्याला प्रमाण मानून या ग्रंथाची रचना केली, म्हणून भोजाचा राम अभ्यासकांना इतर रामकथांतील रामचरिताशी साधर्म्याने वर्णित असल्याचे जाणवणे वावगे नाही. परंतु कवीच्या काव्यप्रगल्भतेचे अध्ययन या स्वरूपाच्या काव्यांचा अभ्यास केल्या शिवाय अशक्य आहे, असे वाटते. म्हणून चम्पू शैलीचे अध्ययन व प्राचीन भाषेचा अभ्यास हे मुय दृष्टिकोन समोर ठेवून अध्ययन केले असता असे लक्षात येते की, भोजाच्या चम्पूकाव्यात काव्य निर्मितीतील वेगळेपण साधण्याचा प्रयत्न कवीने केला आहे. या काव्यात भोजाने वर्णिलेला राम साहित्यकारांनी वर्णिलेल्या नायकाच्या गुणांचे अनुसरण करणारा आहे. जगदेक ईश्वर, जगदेकवीर, त्रैलोक्यधन्वी अशा रामचरित्राविषयी इथे थोडे मांडावेसे वाटते, म्हणून भोजराजाने रेाटलेल्या रामचरितातील विविध पैलू चित्रित करण्याचा प्रयत्न आहे.

वाल्मीकि रामायण या साहित्य कलाकृतीने विविध भाषांतील साहित्यकारांनाच नव्हे, तर प्रत्येक मानवास आदर्शवत् जीवनाची शिकवण दिली आहे. याचेच अनुसरण कवी राजा भोजाने ही चम्पूरामायण या कलाकृतीत केले आहे. वाल्मीकींच्या कलाकृतीचा सन्मान ठेवून भोजाने रामचरितातील विविध पैलू थोड्याफार बदलाने विविध प्रसंगांच्या आधारे रेाटले आहेत. रामजन्माशी संबंधित प्रसंग असेल, पायसदान प्रसंग किंवा रामाचे वनगमन असेल किंवा वनगमन प्रसंगी रामास आलेल्या अनेक प्रसंगांचे वर्णन असेल, अशा विविध प्रसंगांच्या आधारे रामचरितावर अनेकविध वर्णनांचा असलेला प्रभाव किंवा प्रसंग फुलविताना कवीने अलंकारादींची केलेली योजना 'चम्पूरामायणम्' या ग्रंथाभ्यासाने स्पष्ट होणे शक्य आहे.

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KEY WORDS :- 'चम्पूरामायणम्' काव्यातील रामचरितातील विविध पैलू, उपमा अलंकारादि योजना व चम्पूकाव्यातील वेगळेपण.

I. प्रस्तावना :-

अनुभव, चमत्कृती, कल्पनाशक्ती, भावविश्व इ. गोष्टी साहित्य निर्मितीस पूरक ठरतात. सृष्टीत घडणाऱ्या घडामोडी अनुभवाच्या कुंचल्याने रेाटून निर्माण झालेल्या साहित्याला प्रतिभेची, कल्पनेची, शैलीची, भावविश्वाची झालर जोडली असता नवीन कलाकृती निर्माण होते व ती अजरामर होते. संस्कृत साहित्याबद्दलही असेच म्हणावे लागेल. त्यातील गद्यशैली असो की पद्य या दोन्ही शैलींनी किंवा मिश्र शैलीने साहित्यात आपले वेगळे स्थान निर्माण केले आहे.

संस्कृत साहित्यात गद्य किंवा पद्य रचनेच्या तुलनेत गद्य-पद्य या मिश्र शैलीच्या आधारे रचना करणारे कवी कमीच म्हणावे लागतील. आपल्या काव्यप्रतिभेद्वारा आपल्या काव्यातील कल्पनाविलास संस्कृतकवींनी नेहेमीच प्रकट केला आहे. प्रत्येकाच्या बुद्धिसामर्थ्यानुसार आपल्या कविप्रतिभेच्या किरणांनी सर्व विश्वाला या महान् कवींनी आपल्या काव्यकलाकृतींद्वारा व्यापले आहे. कुणी आपल्या गद्यशैलीने; तर कुणी आपल्या पद्यशैलीने. पण काही कवींनी या दोन्ही शैलींचा योग्यरीत्या वापर करून साहित्याला अवीट गोडी निर्माण केलेली आहे. कारण, कवींचा स्वभावच मुळी नेहेमीच अपूर्व निर्मिती हा आहे. आर्थातच या अपूर्वतेचा आविष्कार म्हणजेच ही मिश्रशैली होय.

केवळ पद्य किंवा गद्य शैलीच्या माध्यमातून विविध भावभावनांचे प्रकटीकरण न करता या दोन्हीच्या माध्यमातून साहित्याची आधिकाधिक गोडी निर्माण केली, तर वाचकाला अत्यंत आनंद प्राप्त होईल, हा विचार करून भोजराजाने आपल्या 'चम्पूरामायणम्' या काव्यामध्ये मिश्रशैलीचे कौतुक केले आहे.

गद्यानुबन्धरसमिश्रितपद्यसूक्तिर्हृद्या हि वाद्यकलया कलितेवगीतिः ।

तस्माद्ददधातु कविमार्गजुषां सुखाय चम्पूप्रबन्धरचनां रसना मदीया ।।बाल.३।।

''संवादशैलीचा वापर न करता वर्णनात्मक शैलीच्या आधारे गद्यपद्यमिश्रित शैलीला चम्पू म्हटले आहे''. या शैलीचा वापर कवींनी आपल्या काव्यात यशस्वीरीत्या केलेला दिसतो. या शैलीच्या माध्यमातून कवींनी पौराणिक, ऐतिहासिक घटनांना स्पर्श करून आपली कलाकृती निर्मिली आहे. रामायण, महाभारत, भागवतादि पुराणे, इत्यादींमधील कथानक, एखादा प्रसंग, एादे सर्वश्रेष्ठ, सर्वमान्य व्यक्तिमत्त्व आदींच्या आधारे चम्पू निर्मिती केली आहे.

कुठल्याही साहित्याची अभिव्यक्ति होण्यासाठी ते साहित्य अभ्यासणे आवश्यक असते, म्हणून 'कवी राजाभोज वर्णित- रामचरितातील विविधपैलूं - एक अध्ययन' या विषयाच्या माध्यमातून कवी भोजाच्या चम्पूरामायण या काव्याला अध्ययनासाठी स्पर्श केला आहे.

भोजराजाने शृंगारप्रकाश या ग्रंथामध्ये नायकाची लक्षणे वर्णिली आहेत.

शान्तं प्रयांसम् उद्धतम् ऊर्जस्विनं च केचिद्रसमाचक्षते। तन्मूलाश्च किल नायकानां धीरशान्त-धीरललित-धीरोद्धत-धीरोदात्त व्यपदेशः।'(श्रीवास्तव.१९६३, पा.नं. २४७)

धीरशान्त नायकात शान्तरस, धीरललित नायकात प्रेयस्, धीरोदात्त नायकात उदात्त आणि धीरोद्धत नायकात उद्धतरस निर्मिती हवी. तसेच साहित्यदर्पणकार विश्वनाथानेही नायकाचे लक्षण सांगताना म्हटले ,

प्रयातवंशो राजर्षिर्धीरोदात्त: प्रतापवान् । दिव्योऽथ दिव्यादिव्यो वागुणवान्नायको मत: ।।

(साहित्यदर्पण, ६.९) (सिंग.१९५७, पा.नं. ३६३)

प्रसिद्ध वंशातील राजर्षी, धीर, उदात्त, प्रतापी, गुणवान्, दिव्य, दिव्यादिव्य, या प्रकारची कोणतीही व्यक्ती नायक असावी.

साहित्यशास्त्रकारांनी वर्णिलेल्या गुणांनुसार नायकाला आवश्यक असणारे सर्व गुण रामाच्या व्यक्तिमत्त्वात साकारण्याची किमया सर्वच कवींनी केली व त्यामुळे 'राम' रामकथाश्रित काव्यांतील आदर्श नायक म्हणून वर्णिला गेला. भोजराजाने केलेले वर्णन रामाच्या आदर्श नायकाचीच पावती देतात.

राम हा 'चम्पूरामायणम्' या ग्रंथाचा नायक आहे. रामचरित्रवर्णन अनेक अभ्यासकांनी, कवींनी अनेक भाषांमध्ये रेखाटले. भोजराजाने वाल्मीकि रामायणाचा आधार घेऊन 'चम्पूरामायणम्' या ग्रंथाच्या माध्यमातून रामाचे व्यक्तिचित्रण रेाटले, या चित्रणाचा अभ्यास करताना कवीने रामाचे व्यक्तिस्वरूप न बदलता त्याला आपल्या प्रगल्भ वाणीने खुलविले. प्रस्तुत अध्ययनात भोजराजाच्या ग्रंथाधारे रामचरित्रचित्रणातील पैलू रेखाटण्याचा अल्पसा प्रयत्न आहे.

१) चम्पूरामायणादि रामकथाश्रित काव्यांतील रामचरित्र जाणून घेण्याच्या दृष्टीने अभ्यास करणे.

२) राजाभोजाच्या दृष्टीतून रामव्यक्तिमत्त्वातील विविध पैलूंचा आढावा घेणे.

३) राजा भोजाचे कवी म्हणून वेगळेपण दर्शविणे, इत्यादी उद्देश या अध्ययनाचे आहेत.

II. संशोधनपद्धती :–

रामचरितातील विविध पैलू रेाटतांना विश्लेषनात्मक पद्धतीने विवेचन केले आहे. तसेच कवी भोजाच्या रामचरितातील विविध घटकांचा विविध रामकथाश्रित काव्यांसह तौलनिक अभ्यासाच्या माध्यमातून या अभ्यासात प्राचीन भाषेचे व कवीच्या कल्पनाशक्तीचे, भाषासामर्थ्याचे अध्ययन करण्याचा प्रयत्न आहे. विविध काव्याश्रित रामाचे स्वभावगुण संकलित केल्या शिवाय रामचरितातील विविध पैलूंचे विवेचन करणे शक्य नाही. रामाच्या व्यक्तिमत्त्वातील विविध पैलूंचे वर्गीकरण करणे. म्हणून या अध्ययनाचे स्वरूप विश्लेषनात्मक, वर्णनात्मक, वर्गीकरणात्मक, संकलनात्मक व तुलनात्मक पद्धतीचे आहे.

III. विश्लेषण:–

वाल्मीकि रामायण या साहित्य कलाकृतीने विविध भाषांतील साहित्यकारांनाच नव्हे, तर प्रत्येक मानवास आदर्शवत् जीवनाची शिकवण दिली आहे. याचेच अनुसरण कवी राजा भोजाने ही चम्पूरामायण या कलाकृतीत केले आहे. वाल्मीकींच्या कलाकृतीचा सन्मान ठेवून रामचरितातील विविध पैलू भोजाने रेाटले. त्यामुळे या वर्णनात साम्य असणे ही सहजता आहे. त्याची ईश्वरत्त्वशक्ती, आदर्श पुत्र, आदर्श पती, पराक्रमी, धीरोदात्त या विविध पैलूंवर रामकथाकारांनी रामाचे चित्रण केले, त्यात भोजाची ही संस्कृत कलाकृती पुन्हा एकदा वाल्मीकि रामायणाकडे नेणारी आहे. चम्पूरामायणहा ग्रंथ अभ्यासल्या नंतर याच्या अनुषंगाने वाल्मीकि रामायण वा अध्यात्मरामायण किंवा

महाकवि कालिदासविरचित रघुवंश हे महाकाव्य इ. रामकथाश्रित काव्ये वाचायला हवित, कारण चम्पूरामायण या काव्यावर भोजरायाच्या म्हणण्यानुसार जरी वाल्मीकि विरचित रामकथेचा प्रभाव असला, तरी विविध प्रसंगांवर अध्यात्मरामयण किंवा रघुवंश महाकाव्य आदींचा प्रभाव अस्याचे स्पष्ट जाणवते.

जसे, पायसप्रसंग हे याचे उत्तम उदाहरण आहे. ते उदाहरण इथे देणे अनुषंगिक आहे, असे वाटते. पुत्रकामेष्टी यज्ञातून प्राप्त पायसाचे विभाजन करतानाही भोजाने चम्पूरामायण या ग्रंथात काही बदल केले आहेत. ते बदल कवीने विशिष्ट हेतूने केले असावेत. केवळ रामायणातीलच सर्व प्रसंग जशास तशे घेण्यापेक्षा काही वेगळे प्रसंग रामकथाश्रित कथांमधून घ्यावेत व काही वेगळेपण या माध्यमातून वर्णिता येईल का?, असा विचार भोजराजाने केला असावा किंवा या निमित्ताने वाल्मीकि रामायणाची अथवा अन्य रामकथाश्रित ग्रंथांची गोडी वाचकांमध्ये निर्माण करावयाची असावी, हे निश्चित, कारण पायस विभाजनाचा प्रसंग भोजाने वर्णिला आहे, इथे '**अध्यात्मरामायणम्', महाकविकालिदास विरचित 'रघुवंम्**' या महाकाव्यातील पायस विभाजन प्रसंगाचा प्रभाव असल्याचे दिसते. त्यातील भेद व परिणाम कोष्टकाद्वारे दर्शविणे योग्य ठरेल.

दशरथाचे राण्यांना पायस विभाजन

राण्यांची नावे	**वाल्मीकिरामायण**[१]	**चम्पूरामायण**[२]	**अध्यात्मरामायण**[३]	**रघुवंश**[४]
कौसल्या	१/२	१/४	१/४	१/४
सुमित्रा	१/४+१/८	१/४+१/४	१/४+१/४	१/४+१/४
कैकेयी	१/८	१/४	१/४	१/४

चम्पूरामायणामध्ये सुमित्रेला दशरथ पायस देण्याचे विसरतो, तेव्हा कौसल्या व कैकेयी आपल्यातील अर्धा-अर्धा पायस सुमित्रेला नेऊन देतात.

या वर्णनाचा उल्लेख 'नरसिंहसंहिता' या ग्रंथातही आल्याचा संदर्भ चम्पूरामायण या ग्रंथावर आधारित रामचंद्र बुधेंद्र नामक संस्कृत टीकेत ओलेला आहे.

ते पिण्डपाशने काले सुमित्रायै महीपतिः।

पिण्डाभ्यामल्पमल्पं तु स्वसपत्नै प्रयच्चतः।।[५] (बुधेंद्र, पा नं.२६)

यावरून असे लक्षात येते की, भोजराजाने जरी आपल्या काव्यावर वाल्मीकि रामायणाचा प्रभाव असल्याचे म्हटले आहे. तरी काही ठिकाणी झालेल्या बदलांवर अध्यात्मरामायणादि रामकथाश्रित काव्यांचा प्रभाव असल्याचे दिसते. किंबहुना महाकविकालिदासाच्या रघुवंशाचाही पायसदान प्रसंगावर प्रभाव जाणवतो. अर्थात भोजाने चम्पूरामायणाची रचना करताना रामकथाश्रित अनेक काव्यांचे अध्ययन केले असावे व त्यातून जो प्रसंग आपल्या

१. कौसल्यायै नरपतिः .....महामतिः ।। (वाल्मीकिरामायणम्, बालकाण्डम्, १.१६.२७-२९)

२. कौसल्यायै प्रथममदिशद् भूपतिः पायसार्धं.....पूर्णकामां सुमित्राम्।। (चम्पूरामायणम्, बालकाण्डम् २३)

३. कौसल्यायै सकैकेय्यै.....प्रीतिसमन्विता ।। (अध्यात्मरामायणम्, बालवण्डम्, १.३.१०-१२)

४. स तेजो वैष्णवं.....तामयोजयतामुभे ।। (रघुवंशम्, सर्ग १०.५४-५६)

५) चम्पूरामायणम्, संस्कृत टीका

काव्याला योग्य आहे, हे लक्षात घेऊन त्यातील प्रसंगांना आपल्या काव्यात स्थान दिले व काव्याची अधिकाधिक रुची वाढविण्याचा प्रयत्न केलेला आहे.

वाल्मीकींनी विचारलेला आदर्श पुरुष कोण? व त्याला नारदांचे उत्तर दशरथपुत्र राम!. समस्त जगताला प्रमाण, आदर्श असा राम आहे आणि त्याचे चरित्र रेाटले वाल्मीकींनी.

नारदांनी उत्तम व आदर्शपुरुषाचा उल्लेा करताना म्हटले की, **'मुने वक्षाम्यहं बद्ध्वा तैर्युक्तः श्रूयतां नरः ।'**[६]

या प्रसंगावर विचार केला असता असे लक्षात येते की,

'तपः स्वाध्यायनिरतं तपस्वी वाग्विदां चरम्।

नारदं परिपप्रच्छ वाल्मीकिर्मुनिपुंगवम्।।.....

...कस्य बिभ्यति देवाश्च जातरोषस्य संयुगे।।'[७]

तेव्हा नारदांनी दशरथपुत्र रामाचे नाव वाल्मीकींना सांगितले व रामाचे चरित्रही संक्षेपाने वर्णिले, तसेच रामायण पठनाची फलश्रुतीही सांगितली.

ह्या वर्णनाला चम्पूरामायणामध्ये कवी भोजाने स्थान दिलेले नाही. केवळ या प्रसंगाचा एकावाक्यात उल्लेामात्र केला आहे.

वाचं निशम्य भगवान् स तु नारदस्य प्राचेतसः प्रवचसां प्रथमः कवीनाम् ।

माध्यन्दिनाय नियमाय महर्षिसेव्यां पुण्यामवाप तमसां तमसां निहन्त्रीम्।।[८]

('ज्याची वाणी प्रगल्भ आहे अशा कवीमध्ये प्रथम (आद्यकवी) असा तो भगवान् वाल्मीकि, **नारदाचे वचन ऐकून** अज्ञानाला (अंधकाराला) निवारण (दूर) करण्यासाठी पूण्यकारक ऋषिजनांकडून सेविल्या गेलेल्या तमसा नदीवर माध्यांदिनी करावयाचे (स्नानादि) नित्यकर्म करण्यासाठी गेला.')

इथे वाचं निशम्य भगवान् स तु नारदस्य... असा उल्लेा आढळतो. याहून अधिक महत्त्व भोजाने या प्रसंगाला दिले नाही. रामचरित्राला संक्षेपाने रेाटणे हा भोजाचा मुय हेतु दिसतो.

राम आपल्या गुणांनी, आपल्या कर्तृत्वाने ईश्वरीय अवतारात गणला गेला आहे. ारे पाहता कवीने त्यांना मानव जरी म्हटले, तरी त्याच्या ईश्वरी अवताराचे उल्लेाही कवीने केले आहेत. रावणाच्या अत्याचाराला कंटाळून देवता विष्णूकडे जातात, तेव्हा विष्णूने आपण मानवावतार घेऊन रावणाचा वध करू, हे देवतांना दिलेले आश्वासन रामाच्या ईश्वरी अवतारचा मुय दााला आहे. वाल्मीकींनी रामाला आदर्शपुरुष म्हणून पुढे आणले आहे. परंतु रामाचे केलेले अलौकिक वर्णन रामाच्या ईश्वरत्वाची प्रचीती देणारे आहे. वाल्मीकींनी केलेल्या या वर्णनाचा प्रभाव भोजाच्या रामकथेवर झालेला दिसतो. भोजाने काव्यकल्पनेतून रामाचे ईश्वरत्व प्रभावीपणे रेाटले आहे.

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६) वाल्मीकिरामायणम् १.१.७

७) वाल्मीकिरामायणम् १.१.१-४

८) चम्पूरामायणम्, बालकाण्डम् ५

'अथ रामाभिधानेन कवे: सुरभयन् गिर:।

अलञ्चकार कारुण्याद्रघूणामन्वयं हरि:।।[९]

विष्णूने राम या नावाने (वाल्मीकी) कवींच्या वाणीला अमर करीत दयाशील होऊन रघूच्या वंशाला अलंकृत केले. या श्लोकात आलेली **हरि: कारुण्यात् रघूणाम् अन्वयम् अलञ्चकार।** रामाच्या ईश्वरी अवताराच्या संदर्भाकरिता महत्त्वपूर्ण वाटते.

तसेच, कौसल्येच्या गर्भारपणाचे वर्णन करताना कवीने केलेले वर्णन रामाच्या ईश्वरपदाची प्रचीती देते. कृष्णवर्णा आणि दीर्घ नेत्र असलेल्या तिचा मध्यभाग (उदर) कृशत्वामुळे (गर्भधारणेपूर्वी) अदृश्य असे आकाशच होता. (तो जणु अदृश्य आकाशच वाटत होता) आता मात्र गर्भधारणेमुळे कृशतेला त्यागून भगवान् विष्णूच्या पदाच्या नावाने अन्तरिक्ष म्हणूनच राहिला. [१०]

कवी इथे अतिशयोक्ती व विभावना अलंकाराच्या माध्यमातून रामावताराचे सुंदर वर्णन करतो. ही सर्व वर्णने रामाच्या ईश्वरत्वाचे दर्शन घडवितात. कवी केवळ सुरुवातीलाच रामाच्या ईश्वरत्वाची ओळा देतो असे नाही, तर त्याच्या ईश्वरत्वास त्याने पदोपदी जपले आहे. भोजराजाने रामाच्या अलौकिकत्व, दिव्यत्व, ब्रह्मरूपत्व या गुणांना वर्णून रामावरील नि:सीम भक्तीचे दर्शन दिले आहे.

योगेन लभ्यो य: पुंसां संसारापेतचेतसाम्।

नियोगेन पितु: सोऽयं राम: कौशिकमन्वगात्।।[११]

जो संसाराला कंटाळलेल्या पुरुषांच्या योगाद्वारे (ध्यानाने) प्राप्त होतो, त्या रामानेच पित्याच्या आज्ञेने विश्वामित्राचे अनुगमन केले. इथे 'योगेन लभ्य:' या पदावरून रामाच्या दिव्यत्वाची ओळा होते.

चम्पूरामायणाच्या सुंदरकांडात आलेला '**सीताभिधानकमलां प्रभवे प्रदातुं...**' [१२] या पंक्तीत आलेले कमला हे पद रामाच्या विष्णुरूपाचे व सीतेच्या लक्ष्मीरूपाचे दर्शन घडविते. तसेच कवीने **जगदीश, विष्णु, अद्भुत, निरीह, निर्विकार, आदिपुरुष, परब्रह्म** ही विशेषणे रामाच्या परमेश्वरत्वाची प्रचीती देतात. तसेच कवीने रामाला **सूर्य**[१३]**, चन्द्र**[१४]**, अग्नी**[१५]**, इंद्र**[१६] इत्यादींच्या उपमा देऊन रामाचे व्यापकत्व वर्णिले आहे. जसे, ...**शतमन्युसमानमेवमग्रजमकथयत्।**[१७]**, व्यानशे दर्शशमनं वेदीमिव हुताशन:।**[१८]

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९) चम्पूरामायणम्, बालकाण्डम् ३०

१०) चम्पूरामायणम्, बालकाण्डम् २८

११) चम्पूरामायणम्, बालकाण्डम्३५

१२) चम्पूरामायणम्, सुंदरकाण्डम् ५६

१३) चम्पूरामायणम्, अयोध्याकाण्डम् ८६

१४) चम्पूरामायणम्, युकाण्डम् ५-१

१५) चम्पूरामायणम्, युद्धकाण्डम् २१

१६) चम्पूरामायणम्, अयोकाण्डम् २८-१

१७) चम्पूरामायणम्, अयोध्याकाण्डम् २८.१

१८) चम्पूरामायणम्, युद्धकाण्डम् २१

रामाचा पराक्रम हा रामाच्या दिव्यत्वाला अधिकच तेजोमय करणारा आहे. रामाच्या शौर्याची गाथा गाणारे काव्य रचताना कवीने सर्वांसमोर रामाचे अलौकिकत्व प्रकट केले आहे. भोजाने रामासाठी दिलेली पुढील विशेषणे राम विश्वाचा स्वामी व विश्वैकवीर असल्याचे दर्शवितात. '**शौर्यनिधिः, शौर्यराशिः , त्रैलोक्यधन्वी, जगदेकवीरः, त्रिभुवनैकधनुर्धरः**'

अरण्यकाण्डातही काञ्चनमृगाने रामाचा ध्वनी काढल्यानंतर सीता भयभीत झाली असता लक्ष्मणाने सीतेला रामाच्या पराक्रमाचे वर्णन केले आहे.

'**त्रिभुवनैकधनुर्धरस्य शौर्यराशेरार्यस्य कः श्रद्दधीत कोणपघुणनिमित्तां विपत्तिमिति.....।**[१९]' (त्रिभुवनांमध्ये एकमेव धनुर्धर असणाऱ्या, पराक्रमसम्पन्न, रामाच्या संकटावर किटकासमान कोणता राक्षस विश्वास ठेवेल?)

सीतास्वयंवराच्यावेळी धनुर्भंग झाल्यानंतर परशुरामाने रामाला विरोध दर्शविला त्यावेळी रामाने परशुरामाला पराभूत केले. या प्रसंगी रामाच्या पराक्रमाचे दशरथ यथार्थ वर्णन करतो, हे वर्णन रामाच्या पराक्रमाची प्रचिती देते. दशरथाला रामाच्या पराक्रमाविषयी वाटलेला दृढविश्वास व त्याची लोकप्रियता हे रामाला राजा बनविण्यास पूरक ठरतात.

दशरथाने रामाविषयी म्हटले, '**समस्तक्षत्रपाटनवरिष्ठ....भवितुमभिलषामीति ।**[२०]' – ''संपूर्ण क्षत्रियवर्गाचा नाश करण्यात प्रसिद्ध, धारदार असणाऱ्या परशुरामाच्या अस्त्राला धारण करण्याने भयंकर स्वरूप असणाऱ्या, परशुरामाच्या पराभवामुळे अपरिमित शौर्याने युक्त, सुशीलतेस पात्र, लोकांच्या प्रेमास पात्र, मत्सर विरहित, प्रेमळ अशा माझ्या मुलावर (रामावर) मी या पृथ्वीच्या पालनाचा चिरकाळापासून धारण केलेला भार ठेवून, पूजनीय अशा आपणाकडून अनुमती घेऊन विश्रांतीचे सुा अनुभवण्याची इच करतो आहे.''

रामावर असणाऱ्या दृढविश्वासानेच दशरथाने रामाला रायाभिषेक करण्याचे निश्चित केले. एका पित्याचा आपल्या पुत्राविषयी असणारा दृढ विश्वास व अगाध प्रेम या गोष्टी त्या पुत्राची श्रेष्ठताच गाणाऱ्या असतात, असे निश्चितच वाटते.

रामाने केलेला खर किंवा कबंधराक्षसाचा वध किंवा महाकाय ताटकेचा केलेला वध, शूर्पनोच्या बाबतीत केलेले चातुर्य, रावणासोबत झालेले अपूर्व युद्ध, रावणाचा केलेला वध इ. सर्व गोष्टी रामाच्या पराक्रमाची उदाहरणे आहेत.

पराक्रमी रामाच्या औदार्य गुणाचे कवीने सुंदर वर्णन केले आहे. उदारता हा रामाचा अनमोल असा गुण आहे. कैकेयीने रामाला वनात जाण्यास सांगितले, ते कैकेयीचे वचन रामाने उदार अन्तःकरणाने स्वीकारले व आपल्या मधुरभाषेत कैकेयीला उत्तर दिले की, 'तू माझ्या बाबतीत पक्षपात केला आहेस, कारण रायकारभाराची अत्यंत अवघड जबाबदारी भरतावर सोपविली आणि केवळ वनात फिरण्याची जबाबदारी माझ्यावर सोपविलीस.

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१९) चम्पूरामायणम्,किष्किन्धाकाण्डम् २६-३

२०) चम्पूरामायणम्, अयोध्याकाण्डम् ३-१

२१) चम्पूरामायणम्, अयोध्याकाण्डम् २५

वनभुवि तनुमात्रत्राणमाज्ञापितं मे सकलभुवनभार: स्थापितो वत्समूर्ध्नि ।

तदिह सुकरतायामावयोस्तर्कितायां मयि पतति गरीयानम्ब ते पक्षपात:।।[२१]

वाल्मीकि रामायणातील रामाच्या आदर्शवत् आचरणाचे उदाहरण देताना रामाच्या व कैकेयीच्या संवादातील एक संवाद इथे देणे योग्य होईल. कैकेयीने रामास वनात जाण्याचा आदेश दिला असताना धैर्यशील रामाने कैकेयीला उत्तर दिले, तू जर मला सांगितलेस तर मी सीता, राय, संपत्ती एवढेच काय माझे प्राणही भरतास देईन.[२२]

ही दोन्हीही कवींनी रामाची जपलेली धैर्यशीलता व उदारता आहे.

गुहराजाने अर्पण केलेले राय रामाने मोठ्या उदार अन्त:करणाने त्यागले. गुहाच्या रायाचा स्वीकार न करताना रामाने गुहाला ऐकविलेले शब्द हे रामाच्या अमृतवचनांना प्रकट करतात.'.....**चतुर्दशदशरथकथिता: समा: समापयतु भवानिति ।**'[२३] यावर रामाने उत्तर दिले.

तस्मिन्नित्थं प्रार्थनाभाजि सयौ प्रत्याचयौ रामभद्र: प्रियोक्त्या ।

मातुर्वाक्याद्वल्कलेनावृतं मे गात्रं क्षात्रप्रक्रियां नार्हतीति ।।[२४]

जेव्हा मित्र गुह याप्रकारे प्रार्थना करीत असता मातेच्या वाक्यामुळे वल्कलांनी वेढलेले हे शरीर क्षात्रधर्मासाठी योग्य नाही, अशाप्रकारे प्रिय बोलून रामाने त्याची प्रार्थना स्वीकारली नाही.

या वाक्यातील रामाचे शब्द कुठल्याही आवेशाला वा कुणाविषयी असणाऱ्या द्वेषाला प्रकट करीत नाहीत. इथे स्वकर्तव्याची पूर्ण जाणीव असणाऱ्या वा मातापित्यांच्या आज्ञेचे सहजतेने व आदरपूर्वक पालन करणाऱ्या रामाचे दर्शन होते.

औदार्यता हा रामाच्या स्वभावातील महत्त्वपूर्ण गुण आहे. साहित्यदर्पण या ग्रंथात विश्वनाथाने जणु काही रामाच्या स्वभाव गुणांना निरूनच औदार्याची लक्षणे वर्णिलेली असावीत असे वाटते. '**दानं सप्रियभाषणमौदार्यं शत्रुमित्रयो: समता ।।**'[२५] जो दान करतो, प्रिय बोलतो, शत्रू व मित्रास समान मानतो त्यास उदार म्हणावे.

तसेच रामाच्या उदारत्त्वाची प्रचीती रावण व बिभीषणाबद्दल काढलेल्या उद्गारातून येते. रावणबंधू बिभीषणाचा स्वीकार करताना रामास सुग्रीवादींनी विरोध दर्शविला, असे असतानाही रामाने बिभीषणाचा स्वीकार केला. शरणागताला शरण देणे, हे रघुवंशीयांचे परम कर्तव्य आहे. स्वयं रावण अभयाची याचना करीत असेल; तर त्यालाही मी अभयदान देईन, असा विचार करणारा भोजाचा राम बिभीषणाचा स्वीकार योग्य कसा आहे, हे सांगतो.

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२१) चम्पूरामायणम्, अयोध्याकाण्डम् २५

२२) वालमीकिरामायणम्, अयोध्याकाण्डम् २.१९.७

२३) चम्पूरामायणम्, अयोध्याकाण्डम् ४८-४

२४) चम्पूरामायणम्, अयोध्याकाण्डम् ४९

२५) साहित्यदर्पणम् ३.५५

अभयागतो मदपयाति चेन्मुधा रघवो भवन्ति लघवो न किं सो।

अनुजोऽयमस्तु तनुजोऽथवा रिपो: करुणापदं हि शरणागतो जन:।।[२६]

वाल्मीकींनी रामायणात रामाद्वारे कण्डुमुनींचे वचन देऊन सुग्रीवाला बिभीषणाचा स्वीकार करणे किती योग्य आहे, हे स्पष्ट केले. [२७] **(श्रीवास्तव.१९६३, पा.नं. २४७)**

उदारतेसोबतच धैर्यशीलता, आचरणातील सहजता इ. गुणही रामाचे प्रशंसनीय आहेत. रायाभिषेकासाठी दशरथाने आग्रह केला असता, रामाने त्याचा स्वीकार करणे योग्य समजले नाही. तर रायाभिषेकाच्यावेळी वनात जाण्याचा आदेशही सहजतेने स्वीकारणारा राम धैर्यशीलच असला पाहिजे. कुठल्याही प्रकारचा विरोध आपल्या कैकेयी मातेला न करता किंवा आपल्या पित्याला न करता वनवास स्वीकारणारा राम स्थितप्रज्ञच आहे. वनगमनाचा आदेश माता कैकेयी कडून दिला गेला असतानाही रामाने मातेला दिलेले उत्तर हे रामाच्या धैर्यशीलतेचे उदाहरण आहे.

भीतो भूभरत: किमम्ब भरत: किंवा वनात्पावनात्त्रस्तोऽहं सगरान्ववायककुदस्तात: कुत: शोचति।

दिव्याया: सरितो निवापकरणाल्लघ्वीं प्रतिज्ञामिमामावाभ्यामभिपूरयिष्यति न चेत्पुत्री कथं स्यादयम्।।

'हे माते! भरत काय पृथ्वीचे पालन करण्यापासून भयभीत झाला आहे का?, किंवा मी पवित्र वनाने त्रस्त होईल का?, सगरवंशात श्रेष्ठ माझा पिता कुठला विचार करतो आहे?, (तो) स्वर्गीय सरितेला तर्पण कार्याकरिता आणण्याच्या कार्यापेक्षा सहज असणाऱ्या या प्रतिज्ञेला आम्हा दोघांमुळे (माझ्या आणि भरतामुळे) पूर्ण करू शकला नाही; तर हा (आमचा) पिता पुत्रवान् कसा होईल?'[२८]

इथे कवीच्या प्रतिभेला ारोारच दाद द्यायला हवी. श्रीरामाची धैर्यशीलता व त्यागवृत्ती इ. गुण सांगणे व रामाविषयी लिहिणे, हे काही नावीन्यपूर्ण नाही, परंतु एादा कवी वाल्मीकींचे अनुसरण करूनही आपली काव्य प्रतिभा जपतो व आपल्या शब्दांतून आपल्या उत्कृष्ट कलाकृतीचे दर्शन घडवितो, हे महत्त्वपूर्ण.

वनात जाताना सर्व ऐश्वर्याचा त्याग व तितक्याच सहजतेने परिधान केलेली वल्कले यातून इतरांनाच आश्चर्य वाटण्याारो होते. रामाला दु:ा, वेदना होण्या ऐवजी उपस्थितांनाच त्या होत होत्या.

या श्लोकात आलेली चेत्पुत्री कथं स्यादयम्।। ही पदे रामाचा पित्याबद्दल असणारा आदरभाव प्रकट करणारी आहेत. पित्याची आज्ञा शिरोधार्या' या वचनाचे पालन करणारा राम भोजाने योग्य शब्दांत रेाटला. याची काही उत्तम उदाहरणे इथे द्याविशी वाटतात.

'तत्राचित्रीयन्त सर्वेनिर्विकारवदनलक्ष्मीकमिक्ष्वाकुकुलाध्यक्षमध्यक्षयन्तस्तेषामेव शोक–शङ्कुलीतमानसानामाननेषु पारम्पर्येणास्फुरद्विकार:।[२९]'

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२६) चम्पूरामायणम्, युद्धकाण्डम् १८

२७) वाल्मीकिरामायनम्, युद्धकाण्डम् ७३–२४–३३

२८) चम्पूरामायणम्, अयोध्याकाण्डम् २४

२९) चम्पूरामायणम्, अयोध्याकाण्डम् ३८–१

त्यावेळी लक्ष्मीरूप (शुशोभित) निर्विकार मुा असणाऱ्या, इक्ष्वाकू कुळाचा प्रमुा असणाऱ्या रामाला नजरेने पाहणारे सर्वच जन आश्चर्यचकित झाले आणि शोकरूपाने मने त्रस्त झालेल्या त्यांच्या (पाहणाऱ्यांच्या) मुाावर क्रमाक्रमाने विकार (दु:ाभाव) उत्पन्न झाला.

धर्मपालनाविषयी आपण तत्पर असले पाहिजे, हे लक्ष्मणाला पटवून देताना रामाने पित्याच्या आज्ञेने कुठलेही कुकृत्य करण्यास तत्पर झालेल्या पुत्रांची उदाहरणे दिली.

वत्स, सवितृवंशजातानां पितृनिदेश एव देशिक: सर्वकर्मसु।[३०]

वत्सा! सूर्यवंशात जन्मास आलेल्यांकरिता पित्याचा आदेशच सर्व कर्मांमध्ये आध्यत्मिक गुरु (आचार्यवत्) मानला जातो'.

बहव: खलु पितृनिदेशगौरवाद्गोहत्यामपि मातृवधमपि तारुण्यविनिमयमपि कण्डुरैणुकेयपूरुप्रभृतय: कुर्वाणा निर्विचारमाचारवतामप्रण्या इति गण्यन्ते।[३१]

खारोारच अनेकजन आहेत की यांनी पित्याच्या आदेशाने गोहत्यासुद्धा केली आहे, मातेचा वधही केला आहे, तारुण्य विनिमय केला आहे. (तारुण्य देऊन पित्याचे वृद्धत्व घेतले आहे.) असे ते कण्डू, रैणुकेय (परशुराम), पुरू (ययातिपुत्र) इत्यादी, आचरण करणारे ते कर्तव्य आहे की अकर्तव्य आहे, याचा योग्य विचार न करता योग्य आचरण करणाऱ्यांमध्ये अग्रगण्य म्हणून गणले गेले आहेत.

म्हणून आपणही आपल्या पित्याची आज्ञा शिरोधार्य मानून वनात जाणार असल्याचे रामाने लक्ष्मणाला सांगितले. तस्मादवश्यं वश्य एव पितुरवगाहे गहनमिति।[३२] त्यामुळे पित्याच्या आज्ञेचे पालन करून मी वनात जाणार आहे.

रामाने लक्ष्मणाला केलेला उपदेश हा रामाच्या धर्मज्ञतेवर, धर्मनिष्ठेवर आणि स्थितप्रज्ञतेवर प्रकाश टाकणारा आहे. धर्मज्ञ, स्थितप्रज्ञ असणाऱ्या रामाने आपल्या मातेची आज्ञा माळेसमान धारण करून आज्ञेचे स्वागत केले आहे.

'मातुराज्ञां वहन्मूर्ध्ना मालामिव महायशा:।

वनाय रामो वव्राज जगतामवनाय च।।[३३]'

निषादाने दिलेले राय समर्पक उत्तर देऊन नाकारणारा राम **'मातुर्वाक्याद्वल्कलेनावृतं मे गात्रं क्षात्रप्रक्रियां नार्हतीति।।'**[३४] किंवा सुग्रीवाने किष्किंधानगरीत येण्याच्या केलेल्या आग्रहास सहजतेने नाकारणारा राम **'कर्तव्यनिष्ठ व ध्येयनिष्ठ'**आहे.

न योग्या नगरप्राप्तिरित्युक्तवति राघवे ।

सुग्रीवप्रार्थनाप्यासीद्भरतप्रार्थनासमा ।।[३५]

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३०) चम्पूरामायणम्, अयोध्याकाण्डम् २९-२

३१) चम्पूरामायणम्, अयोध्याकाण्डम् २९-३

३२) चम्पूरामायणम्, अयोध्याकाण्डम् २९-४

३३) चम्पूरामायणम्, अयोध्याकाण्डम् २७

३४) चम्पूरामायणम्, अयोध्याकाण्डम् ४९

३५) चम्पूरामायणम्, किष्किन्धाकाण्डम् २२

नगर प्रवेश योग्य नाही, अशाप्रकारे रामाने जेव्हा म्हटले, तेव्हा सुग्रीवाची प्रार्थनासुद्धा भरताच्या प्रार्थनेसमान ठरली.

भरताने रामास अयोध्येला येण्याची केलेली विनंती याप्रमाणे रामाने स्वीकारली नाही, त्याप्रमाणे सुग्रीवाने केलेली किष्किंधानगरीत येण्याची प्रार्थना रामाने स्वीकारली नाही. सुग्रीवप्रार्थनाप्यासीद्धरतप्रार्थनासमा । या पंक्तीतून भोजाने रामाच्या वचनबद्धतेचे वा दृढनिश्चयतेचे समर्पक वर्णन केले आहे. रामाच्या क्रियेचा समान धर्म दिसून येतो. कोणत्याही प्रसंगात धैर्याने कृती व प्रत्येकाबरोबर समान आचरण हे रामाच्या व्यक्तिमत्त्वाचे महत्त्वपूर्ण गुण भोजाने दर्शविले आहेत.

सर्वगुण सम्पन्न रामावर सर्व सृष्टी नि:सीम प्रेम करणारी असेल; तर यात नवल ते कसले. समस्त प्रजाजन रामावर इतके अनुरक्त आहेत, की रामाचे दु:ा हे आपले दु:ा, त्याचा आनंद हा आपला आनंद मानणारी प्रजा आहे. रामाचा रायाभिषेक होणार या वार्तेने प्रजेचा आनंद गगनात मावत नव्हता, तर तोच राम वनात जाणार हे कळताच तीच प्रजा संपूर्ण अयोध्यानगरी सोडून वनात जाण्यास निघाली. इथेच प्रजेचे रामावरील शब्दातीत प्रेम दिसून येते. रामाला राजा का करावे?, या विषयी दशरथाने प्रजेला विचारणा केली त्यावेळी प्रजाजनांनी दशरथास सुंदर उत्तर दिले.

देवे स्थितेऽपि तनयं तव रामभद्रं लोक: स्वयं भजतु नाम किमत्र चित्रम्।

चन्द्रं विना तदुपलम्भनहेतुभूतं क्षीरोदमाश्रयति किं तृषितश्चकोर:।।[३६] **(च.रा.अयो.६)**

राजा असताना सुद्धा तुझ्या पुत्र रामाची लोक स्वत:च पूजा (सेवा) करोत. तहानलेला चकोरपक्षी चंद्राशिवाय, चंद्राच्या उत्पत्तीस कारण असणाऱ्या समुद्राला आश्रयास जातो का ?

अलंकार योजना ही काव्याला अधिक शोभा देणारी असते, हे वर्णिताना कवी भामह असे म्हणतो की, न कान्तमपि निर्भूषं विभाति वनितामुाम्।. या न्यायाला अनुसरून कवीने चंद्र आणि समुद्र यांचे उदाहरण देऊन दृष्टांत अलंकाराचा योग्य उपयोग केला आणि प्रजेच्या रामावर असणाऱ्या नि:सीम प्रेमाचे दर्शन घडविले आहे. दशरथाला इथे समुद्राची, तर रामाला चन्द्राची उपमा दिली आहे व प्रजाजनांना चकोरपक्षाची उपमा देऊन रामाचे प्रजेमध्ये असणारे अनन्यसाधारण महत्त्व कवी वर्णितो. कवीला चंद्राची शीतलता व प्रकाश यातून रामाच्या शांत व तेजस्विता या गुणांना साध्य करावयाचे आहे.

या वर्णनाकडे कवीच्या कल्पनाचातुर्याचे अंग म्हणून पाहिले; तर रामायणकथेचा तोच तोच पणा वर्णनांध्ये येतो आहे, हे अभ्यासकांना निश्चितच वाटणार नाही. भाषा अभ्यासकांना काव्य कोणतेही असो, त्यातील काव्यमाधुर्य, कविकल्पकता इत्यादी गुणांचा विचार केला पाहिजे, जेणे करून वाचकाला वा अभ्यासकाला कोणत्याही काळातील कोणते ही काव्य उपयुक्त नाही, असे म्हणण्याचा प्रश्नच उद्भवणार नाही. केवळ रामकथा म्हणून अभ्यास होत असेल; तर त्यात तोच तोच पणा येतो, ही शक्यता नाकारता येत नाही, परंतु, काव्य म्हणून व कविप्रतिभा यांचे चिंतन अध्ययनात असल्यास काव्यात असणाऱ्या वेगळेपणाची जाणीव होणे शक्य आहे, हे या उदाहरणातून लक्षात येते.

राम वनात निघाला असताना प्रजेला कोणत्या शब्दात ही वार्ता सांगावी, हा प्रश्न दशरथासमोर होता. कारण दशरथ

३६) चम्पूरामायणम्, अयोध्याकाण्डम् ०६

जाणून होता की प्रजा रामावर प्रेम करते, हे दर्शविण्यासाठी कवी सुंदर शब्दांमध्ये वर्णन करतो.

रामः काममुपाश्रयिष्यति वनं त्यक्त्वा धृतं कौतुकं

लोकस्त्यक्ष्यति कौतुकं चिरधृतं तस्याभिषेके कथम्।।[३७]

रामावर असणाऱ्या दशरथाच्या असीम प्रेमाचे कवीने दर्शन घडविले आहे. दशरथाने तर आपण रामाशिावाय जगूच शकत नाही, असे कैकेयीला ठामपणे सांगितले, हे कठोरहृदये! डोळ्याांना सुंदर असणऱ्या रामाशिवाय माझे जीवन ारोारच राहणार नाही.[३८] लक्ष्मणाला रामावर झालेला अन्याय किंचितही मान्य नाही. तो दशरथ, कैकेयी यांच्या विरुद्ध बंड करतो. परंतु रामाच्या उपेदेशाने त्याचा राग शांत होतो आणि रामावर असणाऱ्या प्रेमाने रामासोबत वनात जाण्याचा निर्णय घेतो.[३९]

इथे उपमा, परिसंया अलंकारांची योजना काव्यातील प्रसंगांना अधिकच ुलविते.

पती प्रेमासाठी सीताही रामासोबत वन गमन करते.[४०] भरतालाही राम वनात गेल्याचे कळते तेव्हा, तो तहानलेले हरिण याप्रमाणे पाणवठ्याकडे जाते त्याप्रमाणे रामाकडे निघाला. मरुपथे पृथुतरग्रीष्मोष्मणि दैवात्कृतोपलम्भमम्भोरुहतटाकं सुधासारपूरितापं भूरितापः सतृष्ण इव कृष्णसारः सरभसं समुपेत्य...।

अत्यंत ग्रीष्माच्या उन्हामध्ये वाळवंटाच्या मार्गावर दैवाने प्राप्त अमृतरसाने परिपूर्ण, कमळांनी युक्त सरोवरावर अत्यंत संतप्त झालेले, तहानलेले काळे हरिण याप्रमाणे वेगाने जाते, त्याप्रमाणे वेगाने जवळ जाऊन.....' [४१]

भरताला तहानलेल्या हरिणाची उपमा देऊन भरताची रामाबद्दलची ओढ कवीने वर्णिली. जशी तहान असह्य होते, तशी प्रेमाच्या माणसां विषयी असणारी ओढ असह्य असते. अर्थातच भरताच्या रामावर असणाऱ्या प्रेमाची अगाधता कवीने वर्णिली आहे.

सर्व जनमानसासोबत सीतेची माता पृथ्वीही अत्यंत दुःाी झालेली आहे. ही कल्पना करताना कवी सुंदर वर्णन करतो.

आबालवृद्धमनुचति रामभद्रमेषा पुरी तदिह मा ालु निर्गुणा स्याम् ।

इत्यादरादिव धरा बहुधा विधाय धूलिच्लान्निजतनुं तमनु प्रतस्थे ।।[४२]

या पद्यामध्ये बहुधा धरा निजतनुं विधाय धूलिच्लात् तम् (रामम्) अनुप्रतस्थे । या पदांची योजना म्हणजे कविप्रतिभेचे सर्वोत्तम उदाहरण होय. प्रजाजनांच्या पाऊलांनी उडालेल्या धुळीतही कवीच्या काव्यकल्पनाविष्काराचे दर्शन होते. कवीला वाटते की, ही धूळ जणु पृथ्वीच आहे व ती रामाचे वनगमन असह्य झाल्याने रामाचे जणु

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३७) चम्पूरामायणम्, अयोध्याकाण्डम् १४

३८) चम्पूरामायणम्, अयोध्याकाण्डम् १५

३९) चम्पूरामायणम्, अयोध्याकाण्डम् २८-१ ते ५, २९

४०) चम्पूरामायणम्, अयोध्याकाण्डम् ४२

४१) चम्पूरामायणम्, अयोध्याकाण्डम् ७९-१

४२) चम्पूरामायणम्, अयोध्याकाण्डम् ४४

काही अनुगमनच करते आहे. याठिकाणी कवीने उत्प्रेक्षा व अपह्नुती अलंकाराची योजना केली व काव्यसौंदर्यात अधिकच भर घातली आहे. अर्थात पृथ्वीलाही रामासोबत गमन करण्याची इच्च झाली आहे, ही कल्पना कवी इथे करतो.

केवळ सजीवसृष्टीच रामाच्या गुणांवर प्रेम करणारी नव्हती; तर अचर ही रामाच्या गुणांवर मोहित झालेले होते. जसे पृथ्वीच्या वर्णनातून धराही रामावर प्रेमकरणारी होती, तसे सूर्यास्तालाही कवीने रामच्या विरहातील मनोवेदनांशी जोडून सूर्यालाही रामाशी एकरूप केले आहे. राम वनात निघाला असता सूर्य ही दु:ाने निस्तेज झाला, अशी कवी कल्पना करतो. इथे कवी उत्प्रेक्षा अलंकाराची योजना करतो.

(काननगमनावस्थां काकुत्स्थस्य प्रेक्षितुमक्षमायामिव क्ष्माभृति चरमे तिरोहितायामह्नाम–धिदेवतायां..., रामाच्या वनात जाण्याच्या अवस्थेला पाहण्यास सक्षम नसणारी दिवसाची देवता (सूर्य) अस्ताचलावर जात असता...) [४३]

कवीने केलेली रामाविषयीची वर्णने कवीच्या काव्यप्रतिभेची ओळा करवून देणारी आहेत. भोजाचे चम्पूरामायण हे काव्य रामाच्या गुणांची जणु काही ाणच आहे. कवीच्या काव्यप्रतिभेतून राम प्रकाशीत होतो. सर्व गुणांचे चिंतन वा कवीने केलेली अनेक वर्णने अध्ययनाला फुलविणारीच आहेत. परंतु अधिक विस्ताराच्या भयाने यथा शक्य रामाच्या व्यक्तिमत्त्वातील व भोजराजा विरचित रामचरितातीक विविध पैलू रेाटण्याचा प्रयत्न या अध्ययनात केला.

III. तात्पर्य :

अकराव्या शतकात भोजराजाने रामकथेला नवीन रचनेत गुंफले. नवीन शैलीमध्ये बांधले. गद्य व पद्य शैलीचा अवलंब करून रामकथेला संक्षेप स्वरूपात रेाटण्याचा यश्वस्वी प्रयोग भोजाने केला. चम्पूरामायणाची भाषा ही अलंकार व समासाने युक्त आहे; तरी ही ती सोपी वाटते. भोजराजाने रचलेल्या या रचने वरून भोजाच्या कवित्वाची ओळा होते. '**जयन्ति ते सुकृतिन: रससिद्धा: कवीश्वरा:।।**' या न्यायाने भोज कवी सर्वश्रेष्ठ आहे. भोजराजाने मूळ रामकथेतील कथानकात काव्याचे माधुर्य वाढविण्याच्या दृष्टीने व वाचकांना काव्याबद्दल आकर्षण निर्माण व्हावे या उद्देशाने आवश्यक तेथे बदल करून आपल्या काव्यप्रतिभेला अलंकारादींची झालर जोडून रामचरित्राला संक्षेपात वर्णन करण्याचे कार्य अत्यंत सहजतेने व कुशलतेने केले आहे.

रामाचे आचरण हे धर्मज्ञेचे धर्मनिष्ठतेचे, स्थितप्रज्ञतेचे प्रतिक आहे, तसेच रामाचा विचारीपणा, विकारराहित्य, दृढनिश्चय, मनाची अचल शांती आदि गुणांचे प्रकटीकरण करणारे आहे. राजनीतीला धर्माचे अधिष्ठान असेल; तर राजनीती योग्य दिशेने मार्गक्रमण करते, हा विचार वाल्मीकींनी रामाकरवी दिला आहे. या विचाराने चम्पूरामायणाचा राम मार्गक्रमण करतो.

चम्पूरामायणातील शांतरसाचे मूर्तिमंत उदाहरण म्हणजे राम. कुठल्याही परिस्थिला सहजतेने स्वीकारण्याची सहजवृत्ती हे रामाच्या स्वभावाचे वैशिष्ट्या. रामाच्या व्यक्तिमत्त्वातून शांतरस पाझरतो. '**शम, शमितशात्रव**' ही पदे शांतरसाची निर्मिती करतात.

या स्वरूपाच्या काव्याचा अभ्यास केल्या शिवाय कवीच्या काव्यप्रगल्भतेचे अध्ययन होणे शक्य नाही, असे वाटते.

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४३) चम्पूरामायणम्, अयोध्याकाण्डम् ४९–१

म्हणून चम्पू शैलीचे अध्ययन व प्राचीन भाषेचा अभ्यास हे मुय दृष्टिकोन समोर ठेवून अध्ययन केले असता असे लक्षात येते की, कवीने रामायणचम्पूकाव्यात काव्यनिर्मितीतील वेगळेपण साधण्याचा निश्चितच प्रयत्न केला आहे.

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6 Money And General Disequilibrium: Theory And Experience

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ABSTRACT :

The failure of new consensus macroeconomics, whether of the new classical or new Keynesian varieties, to find an essential place for money, banking and finance, which it shares with neoclassical and neo-Walrasian general equilibrium models is the principal reason for its inability to explain major economic crises. This paper offers an alternative theory based on Leontief's static open model in which money is always essential but neutral in some circumstances but not in others. The conditions under which an excess of demand for money arises, and causes and perpetuates crises are spelt out. Such propositions of the theory that are empirically falsifiable have been put to test against evidence drawn from cross-country sources. The relative efficacy of fiscal and monetary solutions to the problem of recessions and depressions has been clearly brought out.

Keywords : Money, General Equilibrium, Unemployment Equilibrium, Fiscal Policy

1. INTRODUCTION :

The occurrence of the Great Depression called into serious question the dominant economic paradigm of neoclassical theory then prevalent. In a neat parallel the occurrence of the Great Recession has cast serious doubts on the validity and generality of the new classical and new consensus macroeconomics that have dominated economic thought in recent times. The building blocks of the new macroeconomics that have been particularly suspect for its failure to explain the crisis are the rational expectations hypothesis, the efficient markets hypothesis and the dynamic stochastic general equilibrium model (DSGE). Krugman (2009), Colander et. al. (2009), Buiter (2009), Kirman (2010), Rajan (2010), Stiglitz (2010) and DeLong (2011), to mention a few scholars, have called for major revisions in economic theory. Many suggestions have been offered towards the most plausible lines on which the revisions must be carried out. Some examples are,

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(i) replacing the representative agent assumption by economic interactions between groups of economic agents

(ii) introducing models containing agents with asymmetric information

(iii) replacing the rational expectations and efficient markets hypothesis by behavioural assumptions that allow 'herd behaviour' and 'irrational exuberance' to take place

(iv) introducing models that incorporate, and explicitly recognize problems arising from adverse changes in income distribution

(v) incorporating money, banking and finance into DSGE models in realistic and wholesome roles rather than mechanically adding a monetary policy equation to otherwise barter models of the economy.

However, a review of the theoretical developments during the last decade shows that none of the suggested revisions have been actually carried out either by the proponents of the new macroeconomics or by their critics. Instead, the mainstream economists seem to hold that the occurrence of an economic crisis is not compelling enough to call for substantial revisions in a theory that has been painstakingly developed through successive corrections and refinements to make sure that the theory in agreement with observed economic trends. Events like the Great Depression and the Great Recession are rare blackswan events whose occurrence can be attributed to policy mistakes committed by governments and/or regulators and their failures to initiate quick corrective actions. [See Cassidy's 2010a, 2010b, 2010c, interviews of John Cochrane, Eugene Fama, and Gary Becker]. In fact Lucas (2009) nips in the bud even an attempt to construct a theory that can agree with the facts by bluntly prophesying, "One thing we are not going to have, now or ever, is a set of models that forecasts sudden falls in the value of financial assets, like the declines that followed the failure of Lehman Brothers in September".

Be that as it may, only because some economic events rare it is not reason enough for the theory to ignore them altogether. The fact that they recur in more or less violent forms is reason enough for the theory to make place for them if it is to make a credible claim to generality. In other words the theory should not a priori rule out the possibility of crises; on the contrary it must contain well-defined configurations of behavioural and/or policy parameters that correspond to their occurrence and spell out explicitly the behaviour of the economic variables that would be observed when the economy is undergoing crises.

If this methodological premise is accepted and when it is read against the fact that the banking and financial systems play a central and crucial role in major economic crises like the Great Depression and Recession both in terms of being affected by the crises and in spreading them, the chief drawback of the new macroeconomics and DSGE models

is their inability to make room for money and finance in an essential way. As their very name implies DSGE modules are offered as improvements over the standard general equilibrium models in two respects; they are dynamic and they are stochastic in contrast to the standard models which are static and deterministic. There is no hint that they represent an enlargement in scope – both the standard models and DSGE models have no place for what Hahn (1973) called "essential money". And the monetary policy equation of DSGE models might have some real effects but only when monetary policy shocks are unanticipated. These real effects, however, disappear as soon as agents incorporate the shocks into their rational expectations of inflation. Neutrality of money remains a central tenet of these models. [See Nachane 2018, p.65; Snowdon and Vane 2005]

It is true that in the aftermath of the Great Recession DSGE theorists have made efforts to incorporate money, banking and finance in their models. [See Gertler and Kardi, 2011 and Gertler and Kardi, 2015]. But, as shown by Rogers (2019) money is inessential in their models; it neither appears in the utility functions of agents nor does it appear as a cash or finance constraint of the type advocated by Clower (1965). And as for the banks, they intermediate in a durable capital good and earn a commodity return in terms of a non-durable consumption good. This does not even remotely resemble actual banking. In contrast Villaverde (2009) placed real money balances in the utility functions and budget constraints of the agents just as Patinkin (1965) had done but apparently in oblivion of the fact that Patinkin's formulation was shown by Clower (1965) and Hahn (1965) to be far from satisfactory. Villaverde, 2009 also incorporates income earning bonds by including them in the budget constraint but curiously excludes them from the utility function. This incidentally calls for a review of the efforts to find an essential place for money in standard general equilibrium models.

It is well known that modern discussions of money in general equilibrium theory have their origins in the controversies about Keynes' (1936) thesis that monetary economies do not possess automatic inbuilt mechanisms to clear all markets including the labor market and, consequently, that the government will need to intervene by means of an expansionary fiscal policy to ensure full employment. Pigou (1943 p. 343-351) and later Patinkin (1965) were of the opinion that Keynes' thesis was not theoretically sustainable because he neglected the operation of the real balance effect which would serve as an automatic stabiliser of aggregate demand in the event of deflation and bring it in line with aggregate supply. However, investigations by Clower (1965 and Hahn (1965) revealed that Patinkin's objection itself was not sustainable because in Patinkin's model, money and goods were indistinguishable from one another so that "goods were allowed to buy other goods". Also, Patinkin's argument was based on the awkward assumption that excess demand functions were invariant to the distribution of the money endowment between agents. Further investigations by Hahn (1965) and Arrow and Hahn (1972),

which attempted to give a satisfactory treatment of money in which the excess demand functions were not invariant to the distribution of money endowment came up with the completely nugatory conclusion that modern general equilibrium theory has no place for money, that money has no essential role to play in that theory. Ostroy (1973) then summed up the dilemma of integrating monetary and value theories by asking, "How to make money appear without making standard theory disappear?" and Hahn (1973) concluded that, "There is nothing we can say about the equilibrium of an economy with 'money' that one cannot say about the equilibrium of a non-monetary economy". About a decade later Hahn (1982) noted that, "The most serious challenge that the existence of money poses to the theorist is this: the best developed model of the economy cannot find room for it".

During the last three decades, the chief concern of monetary general equilibrium theory has been directed towards finding substantive reasons for the existence of an "essential" money and demonstrating the conditions under which general equilibrium can prevail in the presence of that money. A large variety of strategies have been brought to bear on this question which nevertheless have one feature in common, viz. all of them alter the initial assumptions of general equilibrium theory itself to make room for a medium of exchange which has a positive exchange value even though it is by itself worthless. This has meant introducing constraints, restrictions, frictions, imperfections, inefficiencies, uncertainties, non-convexities, etc. into the general equilibrium model. Some of the 'successful' strategies have been the cash-in-advance constraint [Clower, (1967), Shapley and Shubik (1971), Sargent (1987)] infinite agent infinite horizon models [Bewley (1980), Gale and Hellwig (1984)], overlapping generations models [Brock 1974, Wallace 2001], sequence economies [Hahn (1971), (1973), Lucas and Stokey (1987)], credit verification costs [Woodford, 1986], search and random matching models [Trejor and Wright, 1995], positive bid-ask spreads [Duffie, 1990], separate budget constraints for individual transactions [Starr, 2002], incomplete markets [Magill and Quinzi (1992), Cass (2006)], uncertainty [Bewley (1980)], utility of holding money [Brock (1974)], acceptability of money in payment of taxes [Starrett (1973)], restriction that Pareto-optional allocations require trade [Duffie, 1990], etc. Reviewing these developments Gale (2010) in his entry on "money and general equilibrium" in The New Palgrave quoted Ostroy's (1987) conclusion that,

"We shall argue that the incorporation of monetary exchange tests the limits of general equilibrium theory……." and himself concluded, "That comment is just as true today as it was then and remains a great challenge for economists who want to develop more satisfactory models of the process of monetary exchange at the level of the economy as a whole".

None of these developments finds as much as a single echo in DSGE models. The development of DSGE models has either taken place in complete innocence of or by a conscious neglect, of these attempts of general equilibrium theorists to find a satisfactory explanation for the existence and use of money leave aside the further institutional developments that have money as its explicit foundation viz. banking and finance.

This paper addresses the question of essentiality and neutrality of money in the context of classical general model in which commodities are produced by means of commodities and labour. It proposes to resolve Ostroy's dilemma cited earlier, "How to make money appear without making standard theory disappear?" by giving all importance to the question of how to make money appear, no matter if standard theory has to disappear to achieve that. The paper is divided into eight sections. The second section articulates a model of the general equilibrium of a barter economy in which transaction costs are absent so there is no essential role for money. This model may be regarded as the counterpart of the Arrow-Hahn (1972) moneyless neoclassical model. The next four sections form the central core of the paper. The conditions for the existence of an essential money have been investigated in a "much-less-than-ideal" model of a barter economy in the third section. The question of the neutrality of money is investigated in the fourth and fifth sections in the context of currency money and credit money. It has been shown that if money is demanded solely for transactions purposes it must be neutral in addition to being essential. But if circumstances impel economic agents to hold additional cash for 'precautionary' or 'speculative' purposes money ceases to be neutral. In these sections, the conditions under which general disequilibrium can arise and the policy actions by which the disequilibrium can be corrected have been investigated. The sixth section puts to empirical test some of the theoretical inferences by presenting evidence drawn from countries that were affected by the crisis of 2007-08. The seventh section contains a brief doctrinal discussion about some prominent interpretations regarding the central message of Keynes' *General Theory.* The eighth section concludes.

2. Ideal (Costless) Barter Economy

The production side of the model will be described by a static open Leontief model that produces gross outputs that are just sufficient to meet the replacement requirements of all industries and the final consumption demands of the workers' households[3] . The use of a static model would facilitate results of the paper with that of the varied and vast literature

3. Incidentally I-O models have also attempted to incorporate money; Leontief and Brody (1993), Brody (2000), Tsujimura and Mizoshita (2003) among others have applied I-O techniques to monetary and financial flows. However, this literature has not concerned itself with the question of the existence of monetary general equilibrium or the issues of essentiality and neutrality of money.

on the subject which too chiefly relied on the setting of a static economy in which growth is absent. Final consumption demands are described by fixed share Engels' coefficients, these being the simplest possible representation of consumer demand as homogenous of degree zero functions of income and prices. (Money illusion is absent.) None of the conclusions of the paper are materially affected if use is made of the theoretically more general and empirically more satisfactory demand systems such as the Linear Expenditure System or the Almost Ideal Demand System[4] . It can be shown that this economic system has a unique positive equilibrium at full employment. The price system is,

$$PA + wL = P \qquad (1)$$

Where A is the matrix of I-O coefficients satisfying the conditions for economic viability, L and P are row vectors of labour coefficients and prices and w is the wage rate. One of the prices can be set as a numeraire and a unique positive solution of the relative prices and the real wage rate can be found from equation (1). Let L* be the total quantity of labour supplied at the real wage rate determined in the price system. If L* is employed, the real net national income is Y = wL*. Accordingly, the quantities demanded for final consumption of the n goods will be

$$C_i = \frac{\propto_i wL^*}{Pi} \qquad \sum \propto_i = 1 \qquad (2)$$

The gross outputs required to satisfy these final consumption demands are obtained as

$$X = (I - A)^{-1} C \qquad (3)$$

where X and C are column vectors. The markets for the goods are cleared. It remains to be shown that the solution *(P,w,X)* must be such as to ensure full employment. This is easily done. The quantity of labour required to produce the output vector X is

$$LX = L(1 - A)^{-1} C$$

From (1) we know P=wL (I-A)-1 so that

$$wLX = wL(1 - A) - 1C = PC = \sum \frac{p_i \propto_i wL^*}{P_i} = wL^*$$

and LX = L*

implying that the demand for labour required to produce gross output X equals the labour

4. Purely qualitative demand functions of the type Qi = f (pi, wj) that are customary in neoclassical theory have been avoided for the reason that demand functions should be "income-constrained" for any Keynesian type of investigation [Clower (1967)].

supplied *L**. In effect, there are n price equations and n output equations in (1) and (3) that determine 2*n* variables; *n*-1 relative prices, 1 real wage rate and *n* outputs. The solution of (1), (2), and (3) is a full employment market clearing equilibrium.

The economic world described in (1), (2), (3) is too good to be true. There is no place whatsoever for money to exist in this economic system. All the commodities and labour are costlessly exchanged for one another. Every agent, whether the F firms working in N industries or the H households that supply labour, transact in all commodities without any cost. A quantity theory equation of the type

$$Md = \sum m_i p_i X_i + m_H wL^* = M^* \qquad (4)$$

where *mi, mH* are proportions of industry sales and household incomes and M* is the supply of money, can be added to determine n money prices, 1 money wage rate and n outputs, but the solution does not differ in any way from that obtained from (1), (2) and (3). But this money is not held by anybody – it does not appear either in price equations of the industries nor in the demand equations of the households. The strict classical dichotomy of real and monetary sectors prevails. It is no wonder that money is an inessential addition to this system, in fact it is redundant; it need not exist because it is inessential. The absence of transaction costs implies the absence of money whose essentiality derives from its ability to reduce transaction costs. Besides being completely inessential money is also completely neutral. In the words of Sraffa (1932) "…… a state of things in which money is "neutral" is identical with a state of things in which there is no money at all …….".

3. Why Money ?

The idealized barter economy operates a transactions technology that is so efficient that there is no need for a less efficient device like money; commodities and labour can be directly or indirectly exchanged against one another but at no costs (we can only fondly hope that we will someday live in the idealized economy). What is needed to explain the emergence of essential money is a less-than-the-ideal hypothetical world of (1), (2) and (3), that is to say, the mechanisms of making transactions in an actual barter economy. [Perhaps the most graphic yet directly appealing account of this can be found in the examples contained in the first two paragraphs of Chapter 1 of Jevon's (1875) classic, *Money and the Mechanism of Exchange]*. Therefore, the harsh features of the wretched economic life that agents lead in an actual barter economy must be reflected in the model of the economy if the essentiality of money is to emerge from the model. After all, money is a techno-institutional arrangement that is designed to reduce the costs of making transactions and, therefore, must consist of (a) a commodity (or commodities) having a peculiar set of properties, viz. durability, divisibility, portability, etc. that enable its users

to reduce transactions costs and on that account make it a generally acceptable medium of exchange and (b) of monetary institutions that administer monetary payments. So let us first visualize a barter economy in which the commodities themselves are used to perform the monetary function. In the absence of double coincidence of wants, every agent would be required, in general, to hold a stock of each of the goods Sik (k=1---F+H) separately, as it were, only for the purposes of making transactions5. Let the annual costs of storage, security, transport, deterioration, decay, damage, pilferage, theft and wastage associated with the holding of each commodity stock for transaction purposes be tik (k=1 --- F+H) in terms of the commodity itself. Then the sum $\sum t_{ik}S_{ik}$ for firms k belonging to industry j when divided by industry j's output will be a coefficient t_{ij} that represents the annual cost of carrying stock *i* in industry *j* for transactions purposes. The gross I-O coefficient matrix for the barter economy will be

$$AB = A + T = a_{ij} + t_{ij}, \qquad i, j = 1\ldots.n$$

The net (disposable) wage income of the households who, too, carry transaction stocks and incur the associated costs will stand reduced to

$$W_N L^* = wL^* - \sum_i \sum_h \sum_{th} S_{th} p_i \qquad h=1\ldots.H$$

Thus, a more realistic description of the barter economy than (1), (2), (3) is obtained as follows,

$$P_B = P_B A_B + wL \qquad (1)'$$

$$C_{iB} = \frac{a_i w_N L^*}{P_{iB}} \qquad \sum \propto_i = 1 \qquad (2)'$$

$$X_B = (I-A_B)^{-1}C_B \qquad (3)'$$

This system too will give a unique positive equilibrium if I-AB fulfils the viability conditions but it will be one which results in higher prices, lower outputs and lower real income than the system (1), (2), (3); because AB> A and wN< w implies PB/w > P/w, CB< C and XB< X.

If one commodity (or a small set of commodities) could be found for which the transactions cost is lowest tmk< tik (i≠m) then the number of commodity stocks required to be held for transactions throughout the economy would reduce from N(F+H) to F + H, a drastic reduction from a power of 2 to a power of 1 and this commodity could serve as the medium of exchange. A commodity that is durable, portable, divisible, malleable etc.

5. Of course, perishables and/or services will not qualify to serve as means of payment. Only say D out of N goods which are durable will qualify. But this is no way affects the generality of the argument.

is most suitable to serve as money – it must be a good store of value if it is to be a good medium of exchange. Thus, the condition for the existence of an essential commodity money can be stated as follows,

$$\sum t_{mk} p_m < \sum \sum t_{ik} p_i \qquad k=1,\ldots.F+H$$

In the single commodity money economy, the I-O matrix will be $A_M = A$ + column (t_{mi}) and $w_n L^* = wL^* - \sum t_{mk} p_m$. If we reasonably suppose that $A_B > A_M > A$ then we get $C_B < C_M < C$, $P_B/w > P_M/w > P/w$ and $X_B < X_M < X$; the commodity money economy is more efficient than the realistic barter economy (1)′, (2)′ and (3)′, but less efficient than the ideal barter economy (1), (2), (3) for which tik = 0. Or, to state the same point in Sraffian terms, the standard ratios R for the three regimes will be $R_B < R_m < R$. In neoclassical language, the monetary economy is Parcto-superior to a realistic barter economy but Parcto-inferior to the hypothetical barter economy that has eliminated all transaction costs.

The efficiency of the commodity money economy in which, say, gold (in the form of coins containing a certified quantity and quality of the metal) serves as money, can be further improved. The *F+H* decentralised hoards that are required to be held for transaction purposes can be centralized into a single hoard in a bank to achieve further economy in the expenses towards storage, security and transport. But, even that is not quite efficient because each agent would have to make say two trips to the bank each day, one to withdraw gold at the start of the day for making transactions during the day and another at the end of the day to deposit his collections, i.e. a total of 2*(F+H)* trips, which would entail transport and in-transit security expenses. If the bank issues bearer currency notes against the gold deposits (and undertakes to convert them when required), these expenses are further economized. Even this can be improved upon by issuing cheque books, installing ATM's issuing debit and credit cards and such developments in payment technologies as RTGS, NEFT, SWIFT, e-banking, etc. At the same time, the costs of inter-regional payments can be economized/reduced/minimized/optimized by individual banks centralizing their hoards into a single central bank which can issue notes of a uniform quality and set up clearing facilities6. Banking, which covers the activities of carrying deposits and making payments is thus seen to be essential as well. At this point, the monetary technology attains such a high level of efficiency that people do not mind even if government nationalizes the central bank to appropriate its gold reserves, suspends the convertibility of currency notes into gold and itself issues notes and enjoys

6. I am conscious that I am not strictly adhering to the actual chronology of the technological development of monetary payment mechanisms but that is only because it does not materially affect any of the conclusions.

the benefits of seigniorage. In so doing the risk of private banks not honouring their notes is eliminated. It is this monetary system, in which money is completely detached and delinked from commodities and labour, whose behavior has been the principal concern of modern monetary economics.

4. Payments Banking

We shall suppose at this stage that banks only administer the system of payments in currency notes (credit money will be the subject of the next section). In performing their functions, banks will incur expenses which they recover by charging a fee per dollar of deposit for services of accounting, safekeeping, withdrawals of cash over the counter or by ATM, issue of cheque books, clearing services, replacement of worn-out notes, etc. The introduction of this non-commodity money into the price system needs to be carefully done. Money is used to facilitate the production of goods but no part of it is ever used up in the process of production. As Adam Smith taught us a long time ago, "Money is a branch of the general stock of society" but is peculiar in that, "it is neither a material to work upon nor a tool to work with". [Smith (1776), Book II, Chapter II]. Thus, only the direct cost associated with holding and using monetary stocks can enter the price equations. The price equations for the economy are as follows,

$$p_c m_i p_i X_i + \sum A_{ji} p_i + wL_i = p_i X_i \tag{5}$$

$$\sum A_{ji} p_i + wL_i = p_c M^* \tag{6}$$

$$\sum m_i p_i X_i + m_H wL^* = M^* \tag{7}$$

In other words, the matrix of I-O coefficients in the price system should now be read as AC = A + *diag* ($p_c m_i$) and it should be presumed that t_{ck}=0 (notes and deposits entail negligible or zero physical wastages), $p_c m_i < t_{mi}\, p_m$ for each industry *i* and $p_c m_H wL^* < \sum t_{mk} p_m$ *k* =1---H where pc is the bank fee per dollar of deposit. Equations (5), (6) require, respectively, that the sales revenues of industries and banks must cover their costs and equation (7) requires that the market for money be cleared. The total labour is now $L^* = \sum L_i + L_C$. Then, the final demands and the gross outputs required to satisfy the final demand are,

$$Fi = \frac{\propto i(wL^* - p_c m_H wL^*)}{p_i} + A_{ic} \qquad \sum \propto_i = 1 \tag{8}$$

$$X = (I-A)^{-1}F \tag{9}$$

It should be noted that the cost coefficients of banking services appear in the price equations but will not appear in the output equations 8 (b). Of course, the effect of bank service charges that households pay and which lower their net income and their final consumption demand as well as the commodity input requirements of the banking sector, will affect the solution of X in 8(b). Also, the price equations (5) become non-linear since the unknowns, P_c and P_i, appear as products. But this does not pose a problem because an iterative solution is always possible. The system of equations (5) to (9) gives an equilibrium solution for n money prices of commodities, *n* outputs, *Pc* the bank fee and *w* the money wage rate provided the terms $p_c m_i$ appearing on the main diagonal of the price system are low enough to ensure overall economic viability. Letting $D = diag\ (p_c m_i)$, the price equations in (5) may be written in matrix notation as

$$P(A+D)X + wLX = PX$$

$$wLX = P(I-A)X - PDX$$

Substituting for X from equation (9) gives

$$wLX = P(I-A)(I-A)^{-1}F - PDX$$

$$= PF - PDX$$

From equation (8) we know that

$$PF = (\sum \propto_i)[wL^* - P_c m_H wL^*] + PE_c$$

where Ec is the vector of Aic. Multiplying (7) by P_c and substituting for $p_c m_H wL^*$ gives

$$PF = (\sum \propto_i)[wL^* - P_c m + PDX] + PE_c$$

And substituting for $p_c M^*$ from equation (6) leads to

$$= (\sum \propto_i)[wL^* - PE_c - wLC + PDX] + PE_c$$

However we already know that $wLX=PF-PDX$ so

$$wLX = w(L^* - L_c)(\sum \propto_i) + PE_c(\sum \propto_i - 1)PDX$$

If all income is spent on the four commodities and $\sum \propto_i = 1$ the equation above reduces to

$$LX + L_c) = L^* \qquad (10)$$

i.e. the demand for labour from the industries and banks exactly equals the labour

available and a full employment general equilibrium obtains.

It is obvious that the monetary general equilibrium obtained from equations 5-9 is completely different from that obtained from equations 1, 2, 3 and 1′, 2′, 3′. Observe also that the price and output systems are not exactly duals of one another as they were in equations (1) to (3) and (1)′ to (3)′. Indeed, it can be said that the exact duality of the price and output systems is a feature of barter economies whether actual or ideal; monetary economies are distinguished by the fact that their price and output systems are not exact duals of one another. For the currency economy under discussion, the matrix to determine the outputs is A but the matrix to determine prices is A+d. The costs of using money and/or monetary institutions are loaded into the cost-price system but they do not appear in the output system as they do in the case of the barter economies of section 3. It means that the use of the monetary technology for transactions has enabled the economic system to operate its production technology at full efficiency. We may now suppose that

$A_B > A_m > A_c = A$ so that $X_B < X_m < X_c < X$, $C_B > C_m > C_c > C$ and $\frac{P_B}{w} > \frac{P_m}{w} > \frac{P_c}{w} > \frac{P}{w}$.

The currency money economy delivers greater outputs than the barter economy and the single commodity monetary economy at lower real prices. Neo-Walrasian theory fails to capture these great advantages of monetary exchange over barter because it lacks the framework of cost-based prices and production-based incomes. In the 'welfare' sense the full employment equilibrium with currency money dominates the rather dreadful one that obtains under the barter system described by (1) ′, (2) ′ (3) ′. This conclusion stands in sharp contradiction to neo-Walrasian findings that the introduction of essential money having positive exchange value results in allocations that are not generally Pareto efficient. [See Starr 2010]. That conclusion is sustainable only if a comparison is made between a system with essential currency money (which entails transaction costs) with the ideal barter equilibrium of (1), (2), (3) in which transaction costs are entirely absent. But then the conclusion is obvious enough to be superfluous.

What can be said about the neutrality of money in this system? The answer, it turns out, depends upon a) the manner of and the purpose for which the change is money supply is effected and b) the technology operated by payments banks. If, say, the government doubles the money supply by dropping currency notes from a helicopter and there were no payments banks then money prices and the money wage double and nothing else is affected. If there are payment banks and the government simply doubles the moneys in all the accounts identical effects would follow. But if the additional money is injected by the government by buying one or more commodities there would be a change in the composition of outputs which would last until the deficit financing continued but the

system would revert to the original equilibrium with double the prices and the wage after the new money is wholly absorbed by the private economy. If there are payments banks, but they can manage the enlarged volume of payments without any additional inputs or manpower all prices and the wage would double but commodity outputs, velocity of money and the bank fee remain unchanged. If, however, banks require additional inputs and/or labour there will be a new equilibrium with a small change in the relative prices and the real wage rate and small reductions in the outputs to the extent that lesser labour is available for the producing industries and a decline in real disposable income of consumers due to a rise in the bank fee. The change in relative prices takes place for the reason that the increase in the bank fee will raise the prices of those commodities whose industries require larger money stocks relative to commodity inputs and labour per unit of output. Of course when it is considered that in any actual economy the total inputs and labour requirements of the banking system is negligibly small in relation to the rest of the economy this departure from non-neutrality fades into insignificance.

From the foregoing discussions classical monetary theorists concluded that money is both essential and neutral. Classical monetary writers were obviously fascinated by this result. Inconvertible fiat money issued by the government is a completely imaginary substance. It is merely an idea. But because it is an idea in which economic agents repose their collective faith, its use vastly improves material economic welfare (greater outputs at lower prices). If, in addition, it does not distort any allocative processes then it is also neutral, that is to say harmless. Modern money was thus shown to be a completely imaginary idea that nevertheless bestowed large concrete economic benefits to society at no cost, externality or risk whatsoever. In this respect the idea of money appeared to be on a par with the idea of God!

But in due course the question was asked, "Is this conclusion generally valid? Does it hold good at all times and in all circumstances or are there conceivable conditions in which it doesn't? If so what are those?" One of the assumptions on which the full employment equilibrium of equation (10) has been shown to exist is that all of the disposable income is completely spent on the produced commodities and the demand for money is exclusively for transactions purposes. What if this does not happen? What if income earners decide to save (refrain from consumption) and to devote a fraction of their incomes to acquiring additional cash for its own sake as it were? Thus suppose

$$\propto_c [wL^* - pcmHwL^*] = \Delta C \sum \propto_i < 1 \qquad i=1....4$$

The immediate consequence is that the production of the full employment levels of outputs cannot be sustained nor can the level of full employment itself; in equation (10) the quantity of labour demanded declines to which is less than in view of The result is a deflationary gap whose size is

$$w[L^* - (LX + L_c) = (1 - \sum \propto_i)[w(L^* - L_c) - PE_c + PDX] \quad (11)$$

The holding of cash for purposes other than of performing transactions, that is to say, for 'precautionary' or 'speculative' purposes, needs some justification because holding idle cash while foregoing of the consumption of commodities makes little economic sense in normal economic circumstances[7] . But there are circumstances when the store of value function might offer more comfort and security for its holders than its immediate medium of exchange function. Typically, this happens when there are fears about the future course of business, fears of default by, and bankruptcies of, financial and non-financial firms, fears of layoffs and unemployment and fears of asset deflation which impels people hold to money as a hedge against impending contingencies[8], in short, a business atmosphere that is fraught with suspicion and fear of counterparty risk. Large scale defaults is the ubiquitous characteristic of business crises. And when defaults by large-sized and highly leveraged firms hit the banks and the news to that effect spreads the crises become system-wide.

Even though, in the foregoing, the disequilibrium consequences of an excess demand for money have been illustrated with reference to households, it is important to note that this will be true of excess demand for money from industries too. This excess demand must be necessarily shown in terms of additional money balances, miepiXi, on the left hand sides of the price equations with no corresponding term on the right hand side. The firms are using a part of their sales revenue to hoard cash. In this case, even if there is no excess demand for money from households, there will be a deflationary gap. Alternatively, the deflationary gap may occur because firms disinvest their commodity stocks, say, on fears of political or industrial unrest and hold the proceeds as deposits but refrain from taking additional loans so that these funds are carried by banks as excess reserves. In effect corporate saving exceeds corporate investment.

The following numerical example illustrates the nature of monetary general equilibrium, the condition under which it breaks down and the policy that must be put in

7. As Smith (1776, p. 421) put it, "Goods can serve many other purposes besides purchasing money, but money can serve no other purpose besides purchasing goods." Smith never considered the possibility that in some circumstances money might be demanded for its own sake; in this he was followed by many classical and neoclassical economists.

8. Keynes (1937), p. 216) argued that uncertainty about the future was the main cause for holding excess money balances, "…….. partly on reasonable and partly on instinctive grounds our desire to hold money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future…. The possession of actual money lulls our disquietude ……..".

place to restore it. Consider an economic system described by the following data:

$$A = \begin{bmatrix} 0.05 & 0.1 & 0.1 & 0.15 \\ 0.25 & 0.30 & 0.15 & 0.25 \\ 0.2 & 0.25 & 0 & 0.15 \\ 0.1 & 0.05 & 0.075 & 0.1 \end{bmatrix}$$

L= (0.5, 2, 1, 4)

mI = (0.05, 0.01, 0.025, 0.04)

mH = 0.3

Aic = (0.5, 0.1, 0.15, 0.25)

Lc = 5

L* = 100 M*= 100 αi = 0.25 (i=1…4)

Table 1 shows the equilibrium prices, bank fee and wage rate and the gross outputs produced in equilibrium. The fourth column shows that $L_X+L_c=L^*=100$ meaning that equilibrium has been attained with full employment. The value magnitudes K and Y denote the capital stock and net national product,

$$K = \sum m_i p_i X_i + \sum\sum A_{ji} p_j + \sum A_{jc} p_j + wL_c$$

$$Y = wL^* = \sum p_i X_i + p_c M^* - p_c \sum m_i p_i X_i - \sum\sum A_{ji} p_j - \sum A_{jc} p_j$$

and V_c and V_y are the transactions and income velocities of money. If money supply is doubled but the banking sector does not need any additional inputs or labour to manage the larger volume of payments the equilibrium obtained is shown in Table 2.

If it is supposed that $\propto_i = 0.2$ (i =1...4) and = 0.2 the corresponding results are shown in Table 3.

Table 1

	Price	**Outputs**	**Real wage rate w/pi**	
p_1	8.3898	13.6759	0.3283	$K=634.7878$
p_2	12.9347	18.8187	0.2129	$LX+ L_c =L^*=100$
p_3	6.9724	17.9489	0.3950	$Y=wL^*=275.46$
p_4	18.6025	8.1439	0.1480	$p_c m_H wL^*=20.6255$
pc	0.2495	--		$V_G = 6.348$
w	2.7546	--		$V_y = 2.751$

Table 2

	Price	**Outputs**	**Real wage rate w/pi**	
p_1	16.7796	13.6758	0.3283	*K=1269.5735*
p_2	25.8682	18.8187	0.2129	*LX+ L_c =L*=100*
p_3	13.9449	17.9489	0.3950	*Y=wL*=550.9361*
p_4	37.2051	8.1439	0.1480	*$p_c m_H$wL*=41.2512*
pc	0.2496	--		*V_G = 6.348*
w	5.5094	--		*V_y = 2.751*

Table 3

	Price	**Output**	**Real wage rate w/pi**	
p_1	8.6876	11.0482	0.3280	*K=529.4794*
p_2	13.3869	15.1403	0.2129	*LX+Lc = 81.5498 = Demand for labour < 100 = L**
p_3	7.2178	14.4174	0.3948	*Y=232.414*
p_4	19.2576	6.5819	0.1480	*pcmHwL*=20.6255*
pc	0.2583	--		*VG = 5.2947*
w	2.8500	--		*Vy = 2.324*

In the situation depicted in Table 3 the velocities of money with respect to the gross and net products show a steep decline, the commodity markets are cleared but there is an excess supply of labour. The resulting deflationary gap measured in terms of labour is 100-81.5498=18.4502 and in value terms it is $2.85 x 18.4502 = $52.5830. Walras' Law holds good; the excess demand for money balances, which is exactly equals the value of the excess supply of labour . If, on the other hand, we force employment to remain at 100 across industries then there would be an excess supply of one or all of the commodities. It is obviously more reasonable to suppose that the commodity markets are cleared and the labour market fails to clear for the simple reason that suppliers of the commodities would like to cut down their losses and maintain a breakeven by supplying only as much as is demanded, a mechanism that is inapplicable to the labour market. The deflationary gap qualifies to be called an unemployment equilibrium in the sense that all commodity

markets are cleared in the presence of unemployment. As Keynes (1936, p.235) put it,

"Unemployment develops, that is to say, because people want the moon; men cannot be employed when the object of desire (i.e. money) is something which cannot be produced and the demand for which cannot be readily choked off."

Keynes (1936 p.230) also supplied the reason for his conclusion,

"…….. money has, both in the long and the short period, a zero, or at any rate a very small, elasticity of production ……. Money, that is to say, cannot be readily produced; - labour cannot be turned at will by entrepreneurs to produce money in increasing quantities as its price rises in terms of the wage unit. In the case of inconvertible managed currency, this condition is strictly satisfied".

The only way in which the disequilibrium can be removed would be for the government to finance a deficit and purchase commodities and/or labour by printing notes. As an example, suppose government decides to buy commodities from the four industries. Then government purchases of G_i =1.0867 units of each of the four commodities [these are added to the final demand vector F in equation 8 (c)] entailing an expenditure of $\sum p_i G_i$ = \$51.0295 brings about the full employment equilibrium shown in Table 4.

Table 4

	Price	**Output**	**Real wage rate *w/pi***	
p_1	8.4010	13.1737	0.3283	$K=630.3187$
p_2	12.9511	18.7211	0.2129	$Y=275.8274$
p_3	6.9817	17.1297	0.3950	$LX+L_c = 100$
p_4	18.6272	8.4603	0.1480	$p_c m_H wL^* = 20.6796$
pc	0.2499	--		$V_G = 6.3032$
w	2.7582	--		$V_y = 2.7582$

It may be observed that the physical multipliers (i.e. increments in industrial outputs due to additional final demand due to government purchases) are all greater than 1. The velocities of money are restored to levels very close to those shown in Table 1. The injection of money is seen to be non-neutral in its effects.

Several alternative mixes of deficit spending may be employed to remove the deflationary gap. For example the government might choose to concentrate the deficit spending on say commodity 1. In that case, the purchase of G1 = 6.085 units requiring deficit spending of \$50.2575 would restore overall equilibrium as is shown in Table 5. Or, the government

can simply offer employment to "dig holes and fill them up" and eliminate the deflationary gap. As these examples clearly demonstrate increases in the money supply brought about by deficit financing have substantial real effects; money is definitely non-neutral.

Table 5

	Price	Output	Real wage rate w/pi	
p_1	8.2595	18.3371	0.3284	$K=650.4941$
p_2	12.7358	18.7669	0.2130	$Y=271.2901$
p_3	6.8651	17.0034	0.3951	$LX+L_c = 100$
p_4	18.3159	7.8236	0.1481	$p_c m_H wL^*=20.0021$
pc	0.2457	--		$V_G = 6.5049$
w	2.7129	--		$V_y = 2.7129$

Although in the illustration above, which pertains to a static economy, the cause of the deflationary gap and the resulting unemployment equilibrium is the decline in consumption expenditure, in the context of a dynamic economy the principal cause would more probably be a decline in investment due to fears regarding the future course of profits.

5. Credit Banking

In the course of administering the payments mechanism of the society, banks discover that the net withdrawals during a period are only a fraction of the total moneys in deposit with them so that, if banks can hold a fraction q of the deposits as reserves to meet the periodic withdrawals, they can lend the remaining amounts as loans and earn interest income. The credit banking system is likely to be more cost efficient because (i) it can help agents to economise their cash balance coefficients mi and mH due to banking products like sweep and cash credit facilities (ii) it can help industries access resources that would otherwise remain idle, and allow them to expand their scales of production. The benefits emerging from these activities account for the essentiality of finance. The banks are now performing two jobs simultaneously. They are lending to earn interest and they are also effecting payments on benefit of their depositors and borrowers. One consequence of this must be noted. Unlike payments banks that hold 100% deposits in reserves and are fully solvent at all times there is a possibility that lending banks will default to their depositors if the bank assets go bad. So if depositors have any reason to fear bank default they will prefer to withdraw their deposits and use currency money instead.

The balance sheet of the banks is shown in Table 6.

Table 6

Banks' Balance Sheet

Liabilities	Assets
Industrial Deposits M_I	qM^* Reserves
Household Deposits M_H	$(1\text{-}q)M^*$Advances
Total Liabilities $M_I + M_H = M^*$	***M^** Total Assets**

As before $M_I = \sum m_i p_i X_i$ *and* $M_H = m_H wL^*$. If we suppose that only firms take loans the system of equations of the economy is as follows

$$\delta k(m_i p_i X_i + \sum A_{ji} p_j + wL_i) + \sum A_{ji} p_j + wL_i = p_i X_i \qquad (12)$$

$$\sum A_{jB} p_j + wL_B = K(1-q)M^* \qquad (13)$$

$$\delta(\sum m_i p_i X_i + \sum \sum A_{ji} p_j w \sum L_i) = (1-q)M^* \qquad (14)$$

$$\sum m_i p_i X_i + m_H wL^* = M^* \qquad (15)$$

$$\text{Fi} = \frac{\alpha_i \; wL^*}{p_i} + A_{iB} \qquad (16)$$

$$X = (I - A)^{-1} F \qquad (17)$$

where δ is the debt-equity ratio of industries and k is the rate of interest.

Equation (12) needs to be interpreted carefully. In line with static general equilibrium theory, it has been supposed that the rate of profit on equity capital is zero.

$$(1\text{-}\delta)\, r\, (m_i p_i X_i + \sum A_{ji} p_j + wL_i) = 0$$

Therefore, equation (12) requires that the sales revenues of the industries be sufficient to cover only the whole of input and wage costs and the interest costs of their borrowings. It should be noted that the net national product at factor cost and at market prices continues to be *wL**, i.e. the net interest paid by industries does not feature in it. This is readily seen by substituting (13) and (14) in equation (12) on the left hand side and adding the equations across industries. It is supposed that the banks do not now levy service charges on depositors but recover their intermediation costs from the interest payments of borrowers. Therefore, nothing is netted out from the wage income; the whole wage income is disposable income. Also, since the deposits are demand deposits no interest is

paid on them. Equations (12) to (17) contain 2*n*+3 independent equations to determine as many unknowns, i.e. n money prices of commodities, n outputs, 1 money wage rate, 1 interest rate k and 1 debt-equity ratio δ. Equation (12) requires that sales revenues of industries should cover costs, equation (13) requires the interest revenue of banks to cover intermediation costs, equation (14) clears the deposit and loan markets, equation (15) is the quantity theory equation that clears the money market and equations (16) and (17) clear the commodity markets. To prove the existence of a full employment market clearing equilibrium we proceed as follows. Let D = diag (δkmi) and let EB be the column vector containing AiB. Then the price equations (9) in matrix notation are

$$Pd + (1+\delta k)\, PA + (1+\delta k)wL = P$$

so that

$$(1+\delta k)wLX = P[I-A-\delta kA - d]\,(I-A)\text{-}1\ F$$

$$= PF - \delta kPAX - PDX$$

From equation (13)

$$PF = wL^* + PEB$$

$$= wL^* + k(1-q)\, M^* - wLB$$

$$= wL^* - wLB + \delta k[\sum mipiXi + PAX + wLX]$$

$$= wL^* - wLB + PDX + \delta kPAX + \delta kwLX$$

In view of (15), however,

$$(1+\delta k)\, wLX = wL^* - wLB + \delta kwLX$$

so that

$$LX + LB = L^*$$

This completes the proof of the existence of a full employment market clearing equilibrium. If we let α_i=0.25 i =1…4, then for the numerical example above (all data remain the same $A_{iB} = A_{ic}$ and $L_B = L_C$ except that M* = 100 now stands for deposits and q = 0.1 is the fraction of bank deposits held as reserves) an equilibrium is obtained. This is shown in Table 7. If, however, there is an excess demand for money, a deflationary gap will emerge which whose size is $\alpha_D wL^* = w(L^*-L_d) = w(LX+L_g)$. The results are shown in Table 8.

Table 7

	Price	**Output**	**Real wage rate w/pi**	
p_1	9.0609	13.5735	0.2999	*K=675.8695*
p_2	13.8437	18.7658	0.1963	*Y=271.76*
p_3	7.4430	17.9130	0.3651	$LX+L_B = 100$
p_4	19.5019	8.1921	0.1393	$V_G = 6.7586$
w	2.7176	--		$V_y = 2.7176$
k	0.2832	--		
δ	0.1345	--		

Consider now the consequences of an excess demand for money. If, α_i =0.2, i =1…4 and α_D=0.2 (a fraction of household income devoted to holding additional deposits) the resulting disequilibrium is shown in Table 8.

Table 8

	Price	**Output**	**Real wage rate w/pi**	
p_1	9.6792	10.7168	0.2909	K=566.5104
p_2	14.7023	14.7825	0.1915	Y= 225.312
p_3	7.9092	14.0856	0.3560	LX+LB = 80
p_4	20.6279	6.4977	0.1365	VG = 5.6651
w	2.8164	--		Vy = 2.2531
k	0.2970	--		
δ	0.1620	--		

In comparison with the somewhat messy expression for the deflationary gap in equation (11) it can now be neatly expressed as $L^* - L_d = 20$ in labour terms and as $\alpha_D wL^* = w(L^*-L_d = w(LX-L_B) = \$56.328$ in value terms.

The transition of the economy from the full employment equilibrium of Table 7 to the unemployment equilibrium of Table 8 is turbulent as is only to be expected. The immediate impact of a shortfall in demand resulting from saving and hoarding in the form of cash is a decline in the demand prices (i.e. market prices) of commodities. These may be obtained from the expression,

$$p_{id} = \frac{\sum \propto_{ij} piXi + \propto_i Y}{x_i} \qquad i = 1.....4 \qquad (18)$$

where the numerator on the right hand side shows the total (intermediate and final) expenditure on commodity which divided by the output being produced gives its demand price. For the data in Table (7) these workout to p_{id} = 7.73989, p_{zd} = 13.0553, p_{3d} = 6.6321, p_{4d} = 17.2780 all of which are lower than their supply prices shown in Table 7. The total losses the industries incur if they produce and try to sell the outputs in Table (7) are 17.9446, 14.7949, 14.5256 and 18.2839 respectively. The industries are forced to cut down their outputs and their purchases of inputs and hiring of workers until the unemployment equilibrium of Table 8 is reached where demand prices once again equal the supply prices. But as soon as losses are incurred the prices of bonds and equity shares (which in equilibrium were trading at par) issued by the industries must crash because their investors expect defaults due to the crash corrosion in their net worth. And they do so simultaneously in all industries making the crash a "Minsky moment"! [Not quite because Minsky moments are usually preceded by speculative booms which have not been explicitly considered in this paper]. It may be noted in passing that complete wage-price-interest rate flexibility has been supposed in the model. What that flexibility ensures, however, is not an automatic tendency to revert to the original full employment equilibrium of Table 7 but a tendency to attain the new unemployment equilibrium of Table 8.

The illustrations of the deflationary gap depicted in Tables 3 and 8 for the currency and credit money systems are open to the objection that we have not permitted three conceivable inbuilt stabilizing mechanisms to play their role. The first mechanism consists of the voluntary reductions in the supplies of labour due to the decline in the real wage rate caused by the deflationary gap; to the extent that a decline in the real wage rate causes a decline in the willingness to work, the effective supply of labour L* would shrink and cause the size of unemployment $L^* - L_d$ [where $L_d = LX + L_B$] to decline as well. This objection is valid as far as it goes. But the point is that it does not go very far. This is readily seen from the illustrations themselves. Suppose that the ideal situation obtains in which a decline in the real wage rate (measured say in terms of commodity 1) is such as to reduce L* by exactly such an amount as to eliminate unemployment, i.e., $dL^* = L^* - L_d$. In effect the slopes of the labour supply functions dL^*/dw^* (w^* is the real wage rate) for Tables 3 and 8 would have to be 61500.66 and 2222.22 and their elasticities $(dL^*/dw^*)\ (w^*/L^*)$ would have to be 201.906 and 6.664 respectively. But observe that the underlying economic systems of Tables 3 and 8 are otherwise identical except that the former has payments banks and the latter has payments-cum-lending banks. Why on earth

should this difference affect the behaviour of labour supply under the two regimes? That is not all. Different sizes of the deflationary gap also call for widely different elasticities of labour supply to correct the unemployment. Will labour supply elasticities in practice vary with the monetary regime? Will they vary with the size of the deflationary gap? And, if so, will they possess the desired size? It is impossible to find satisfactory answers to these questions. In their absence it is best to conclude that the labour supply functions do not provide reliable inbuilt devices to correct the unemployment equilibrium and to suppose instead that the level of employment is determined by the effective demand for labour which, in turn, is determined by the effective demand for outputs.

The second inbuilt mechanism is the inducement for new investment that follows the act of saving and placing it in bank deposits. A comparison of the prices in Table 7 (at full employment equilibrium) and Table 8 will show that the nominal prices of the four commodities have risen by factors of 1.0682, 1.0620, 1.0626 and 1.0577 respectively. Deflating the nominal interest rate of 0.2970 in Table 8 by these factors will give real interest rates (in terms of the commodities) of 0.2780, 0.2796, 0.2795 and 0.2807 which are lower than the real (equal to nominal) interest rate of 0.2832 in Table 7. This reduction should induce new investment. But it won't for the simple reasons that 1) in the course of the recession that caused the system to go from Table 7 to Table 8, the rate of profit on existing investment turned steeply negative which caused the industries to undertake disinvestment and 2) in the new less-than-full-employment equilibrium with commodity markets cleared the rate of profit is zero and any attempt at new investment leading to increased outputs will cause the rate of profit to become negative because the outputs will have to be sold at demand prices that stand below the unit costs of production. The marginal efficiency of new investment must, in a situation of a break-even of revenues and costs, be supposed to be negative because any additions to outputs of any of the commodities can be sold only at a market (demand) price less than the cost of production which is equal to the equilibrium price and result in losses.

The third inbuilt mechanism that has a potential to restore the level of aggregate demand lies in the process of financial intermediation itself. In the credit banking system banks convert deposits into loans and loans are used by firms to purchase inputs and labour. So if banks find themselves with excess deposits they will use (at least part of them after providing reserves) to make additional loans which firms will use to buy inputs and hire labour and pull up the level of aggregate demand. But banks cannot simply lend the excess reserves; excess reserves are the symptom of the inability and unwillingness of borrowers to borrow and of banks to lend. This mechanism too does not work in the automatic mode. To see why consider Table 7. As it stands it shows a contradictory

situation. In fact with only 80 units of labour employed and earning and spending $225.316 ($2.816x80) the gross output vector actually produced is (8.5734, 11.8260, 11.2684 5.1982) with money prices and real wage rates as shown in the table. At these actual output and employment levels the demand for money (equation 12) stands at $80 and the demand for loans (equation transactions 11) stands at $72. Accordingly, the actual balance sheet of the banks shall stand as shown in Table 9.

Table 9

	Liabilities		**Assets**
Industrial Deposits	12.4052	Required Reserves	8
Household Deposits	87.5948	Excess Reserves	20
		Advances	72
Total Liabilities	**100**	**Total Assets**	**100**

The required household deposits for transactions decline to (0.3) ($225.316) = $67.5948 which when added to the transactions demand of industries of $12.4052 gives a total of $80 and $20 are the "precautionary" demand for deposits which are carried by banks as excess reserves. Banks cannot lend them simply because there is no demand for them. An obvious consequence of this is that the money multiplier, which is the ratio of the money supply (total deposits) to reserves has declined from 100/10=10 in the equilibrium shown in Table 7 to a level of 100/28=3.57 in the recessionary situation shown in Tables 8 and 9. In short, the only way in which the economic system can adjust to an excess demand for money in the face of a money supply constraint is by activating mechanisms that will eliminate that excess demand. But those mechanisms are themselves subject to the constraint they should not result industrial non-viability, i.e. industries should not and will not suffer continuing losses but must break even. Under these circumstances the outputs, sales revenues and employment and household income decline leading to a decline in the transactions demand for money by a magnitude that exactly equals the excess demand for 'precautionary' balances. This is the situation shown in Table 8. But if this money supply constraint is removed by the government which stands ready to finance a deficit to buys goods/hire labour has no difficulty in reverting to the full employment equilibrium shown in Table 10.

In parallel with the earlier case of currency money, Walras's law holds – the excess demand for money balances, $\alpha_D wL^*$, equals the excess supply of labour, $w(L^* - L_d)$, so that $\alpha_D L^* = L^* - L_d = 20$, which in value terms is $57.6814. It is quite obvious from the context itself that there is nothing that monetary policy can do. The deflationary gap has arisen in a situation in which none of the instruments of monetary policy are active. Therefore, it can only be eliminated by deficit financing of $54.4225 to finance

government purchases of Gi=1.089505 units each of the four commodities and restore the full employment equilibrium shown in Table 10. It will be observed that in this case, too, the physical multipliers are greater than one, that is to say, increments in gross outputs due to additional purchases of 1.089 units of the commodities, are all greater than 1.089 units. The real wage rate measured in terms of the four commodities is seen to rise in the course of attaining the full employment equilibrium by means of an expansionary fiscal policy. Observe that in this case there is no need to finance the entire deficit by printing notes. It can be partly financed by issuing bonds to the banks/public and obtaining the idle balances with them.

Table 10

	Price	**Output**	**Real wage rate w/p_i**	
p_1	9.0812	13.0895	0.2996	$K=671.5965$
p_2	13.8722	18.6782	0.1961	$Y= 272.11$
p_3	7.4585	17.0987	0.3648	$LX+L_B = 100$
p_4	19.5396	8.5000	0.1392	$V_G = 6.7160$
w	2.7211	--		$V_y = 2.7211$
k	0.2837	--		
δ	0.1355	--		

The actual story of the consequences of a deflationary gap in a credit money economy is likely to unfold along the following dramatic but by now familiar lines. Sharp reductions in the sales revenues of the industries will result in defaults. Unsold stocks will cause prices of goods to decline sharply below their normal levels. As firms begin to show operating losses their credit ratings are downgraded and the prices of debt and stocks issued by the firms crash eroding in the process the ability of their holders to remain solvent. The transition from the full employment equilibrium shown in Table 7 to the unemployment equilibrium shown in Table 8 is a period of sharp declines in commodity prices and operating profits accompanied by sharp declines in asset prices and increases in bad assets of banks. The act of default is typically a multi-layered action. The defaulter will usually initiate it against those business entities, whether they are workers, suppliers or bankers, who, in his opinion, are least likely to retaliate quickly and effectively. These will vary from business to business. For some it may be easier to default on wage payments than on suppliers' bills. In others vice versa. For some businesses it may be

easier to keep suppliers at bay for shorter or longer periods as compared to bankers and vice versa for others. Those who are defaulted against will in turn look at possibilities for defaulting against others. And so on. The short point is that default can become contagious and spread across sectors of the economy. Bank loans will start going bad. The ability of banks to service their depositors will begin to erode. A crisis of confidence will build up and if unchecked may lead to runs on banks. Government may rush to the rescue by, say, financing deficits to acquire the bad assets of banks (quantitative easing) and pumping reserves into them. However, in the face of (a) bad debts experienced by the banks and (b) the unwillingness and inability of industries to service additional debts due to a general decline in demand, its impact would be limited at best to banks carrying excess reserves and sustaining the confidence of their depositors. Fiscal policy fails if it attempts to employ the monetary channel for its operation (7). On this basis Krugman (1998) has called for the revival of the idea of liquidity traps in which the pumping in of the monetary base into banks merely ends up in additions to reserves without spilling over into outputs. But this manner of deficit spending cannot directly remedy the deflationary situation. Deficit financing can remedy the situation only if it is used to purchase goods and/or labour either directly or indirectly but not otherwise.

The situations depicted in Tables 3 and 8 have been called deflationary gaps. When the gaps are corrected by means of deficit financing, the resulting situation shown in tables 4, 5 and 10 shows a fall in the money wages and prices, increases in outputs of commodities and a definite increase in the real wage rate. In other words, deficit financing made to correct the deflationary gap has the effect of increasing the real wage rate in the course of raising output and employment.

Disequilibrium with an inflationary gap is seen to arise if previously hoarded cash is brought into play in the market for currently produced outputs, whether by industries or households. In that case, $LX + LB > L^*$ and the disequilibrium can be corrected by means of a surplus budget. It also arises if governments' deficit spending exceeds that which is required to clear the deflationary gap in which case the correction can be made either by reducing the deficit or by employing the instruments of monetary policy eg. imposition of CRR

6. Doctrinal Discussion

The general theme of this paper has been a subject of an extensive debate and unending controversy among several competing schools of economic thought. This literature has employed models of varying degrees of complexity and detail. Even though this paper has employed a classical model of production and prices to inquire into the question of

monetary general equilibrium, it is only natural to expect that many of its results will neatly overlap with those in the literature and a few of them will differ. Some remarks are in order on those aspects in which the results or their interpretations differ. The first issue concerns the relationship of Keynesian economics with Say's Law, Walras's Law and the quantity theory of money. Keynes explicitly repudiated Say's law and the quantity theory of money and stated that the General Theory was his 'final escape' from them. The examples of the deflationary gap in sections (4) and (5) of this paper clearly show that Say's law definitely does not work; in the face of an excess demand for money, it is the effective demand for goods that determines their supply and, therefore, the volume of employment. Keynes did not mention Walras's law by name but some Keynesians strongly argue that Keynesian economics necessarily repudiates Walras's law, that Keynes's unemployment equilibrium must be understood as a 'quantity constrained' non-Walrasian equilibrium in which the effective demand falls short of the notional or planned demand. [Clower 1965, Hahn 1978]. Clower (1965) has summed up his interpretation of Keynes' contribution by stating, "Either Walras's law is incompatible with Keynesian economics or Keynes had nothing fundamentally new to add to orthodox economic theory." And more pointedly, Clower (1965) concludes, "Keynesian economics is price theory without Walras's law". [Also see Leijonhufvud (1968)]. However, in the theoretical scheme of the present paper, the unemployment equilibrium in sections (4) and (5) has been found to coexist with Walras's law, i.e. excess demand for money exactly equals the excess supply of labour with all commodity markets cleared.

The second issue concerns the validity of the IS-LM formulation in its traditional (Hicks, 1937, p. 147-159) or the more general Wicksellian versions (eg. Patinkin, 1958, Tobin, 1969, Friedman 1974, p. 1-62) for understanding Keynesian economics in relation to the 'classics'. A perusal of the disequilibrium situation depicted in Table 7 shows that there is an excess of saving over investment *(S>I)* caused by, and equal to, the excess demand for money *(L>M); S-I* and *L-M* are alternative expressions of the same underlying phenomenon. Clearly this is not a situation that can in any sensible way be depicted on the *IS* or *LM* curves because by their very construction *IS* and *LM* are loci of points showing the national incomes and interest rates for which $S = I$ and $L = M$.

The third issue pertains to the cause of the deflationary gap. Clower (1965) and Leijonhufvud (1968) find the cause to lie in the possibility that with quantity constrained demand functions the sum of the excess demands for goods, labour and money is less than zero. This is not borne out by the model employed in this paper; the demand equations 2, 8, and 13 are income constrained but that by itself does not prevent the economy from attaining the full employment equilibrium with clearing of all markets illustrated

in Table 1 and Table 6. Post Keynesians like Chick (1983), Kaldor (1981), Kohn (1981), Kurz (2016), Rogers (1986) find the cause to lie in the idea that the exogenously given conventional rate of interest at which monetary equilibrium is attained (the point at which the rate of profit equals the rate of interest) is so high that it constrains investment and, therefore, effective demand, at a point of unemployment equilibrium. While this can undoubtedly happen the important point is that there is no independent way of knowing how high the rate of interest must be for it to constrain investment to a level where it falls sort of saving. The models in this paper directly echo the conclusions of Hahn (1977), Davidson (1978), Garegnani (1978) and Posner (2011), who found that unemployment equilibrium is the result of the desire for money as a "resting place of saving". As Garegnani (1978) put it, "Money does play an essential role for effective demand in that … it allows the circle of production-income-demand-production to break in the saving-investment link". More recently Posner (2011) reached essentially the same conclusion in the context of the Great Recession when he wrote, "Hoarding, which under the name 'liquidity preference' plays a key role in Keynes's economic theory, is a way in which the financial system can decisively affect the non-financial system, by reducing aggregate demand".

It is evident that the phenomenon of a deflationary gap with an unemployment equilibrium simply has no occasion to arise in the dominant theories of modern macroeconomics such as the new classical or new consensus macroeconomics; there is no configuration of model parameters in these theories for which a chronic disequilibrium could arise. The assumptions of a representative agent, complete markets and continuous clearing of all markets rule out disequilibria. The financial sector is absent and so are the possibilities of asset defaults and bank runs. Intertemporal optimization by the representative agent for all time to come implies that recessions, even if they were to occur, are optimal so that any policy interventions to correct them would only make the situation suboptimal.

7. Evidence

The Great Recession that started in 2007 provides a natural setting to put to empirical test some of the central empirically falsifiable propositions of the models in sections (4) and (5) and their illustrations as shown in tables 3, 8, and 9. [We shall be concerned mainly with the consequences of a liquidity crunches leading to demand failures that characterize serious macroeconomic crises, not the specific triggers that lead to them eg. the stock market crash in the US I n 1929 prior to the onset of the Great Depression in 1930, sudden capital outflows in the Asian financial crisis of 1997, the decline in housing prices in the 2007 in the US etc]. These propositions are,

(i) the growth rate of the economy and almost all its sector experience sharp and sudden declines (See Graph 1)

(ii) the velocity of money declines and the unemployment rate increases if a recession is caused by an excess demand for money which in turn has been caused by a panic in business conditions. (See Graph 2)

(iii) the money multiplier must decline in a recession that is accompanied by declines in the rate of growth of the demand for credit. (See Table 12)

If the business panic is accompanied by a banking panic then two additional phenomena must be observed

(iv) the desired currency to deposits ratio of the public increases if banks and financial institutions fail or are expected to fail. (See Graph 3)

(v) partly because of the desire for immediate and ready liquidity, partly because of the fear of bank failures and partly because long term interest rates are brought down to levels that are perceived to be unremunerative in relation to the benefits of possessing liquidity and averting risk, the desired demand deposits to averting risk, the desired demand deposits to time deposits rises until the time that confidence in banks is restored. (See Graph 4 and Table 11)

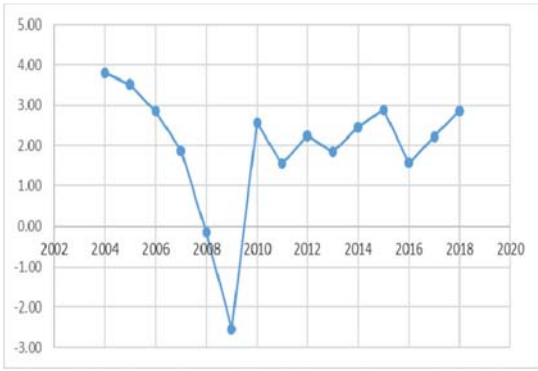
(vi) And so far as the effectiveness of policy instrument is concerned, monetary policy instruments in general and the pumping of funds into the banking system by means of quantitative easing (QE) and troubled assets recovery programme (TARP) will not stimulate bank lending and not prevent banks from carrying excess reserves. (See Table 12)

(vii) deficit financing is the only direct and effective method of bringing down the unemployment rate and stimulating aggregate demand provided, as will become apparent, there are no overly generous welfare-oriented labour market interventions in operation. (See Graph 5)

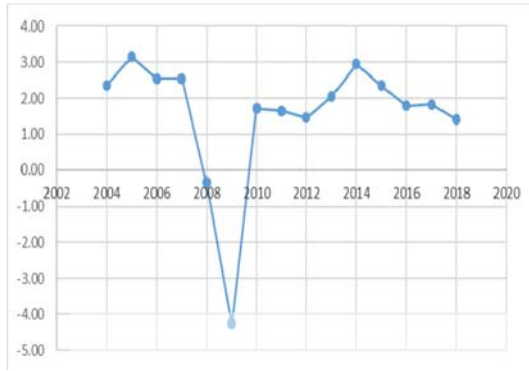
Graphs 3(a) to 3(d) show the behaviour of the currency to deposits ratio. Observe that upward movements are clearly visible during the crisis period or immediately thereafter in the US, UK and Eurozone but not so much in Japan where failures of banks were not as endemic. Graphs 4(a) to 4(d) show increases in the demand-deposits to time-deposits ratios in all the crisis affected countries in the immediate aftermath of the crisis followed by declines after the crisis of confidence in banks subsides as a result of QE and TARP.

Graph 1: Economic Growth Rates

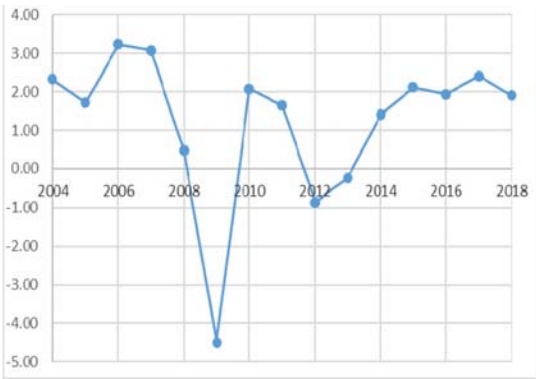
1(a) US



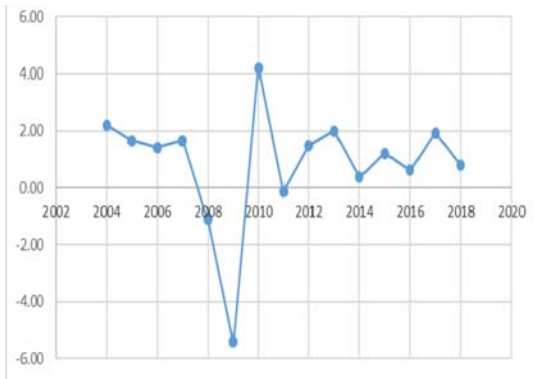
1(b) UK



1(c) Eurozone

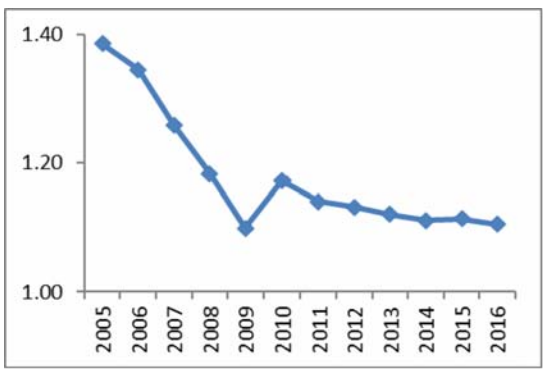


1(d) Japan

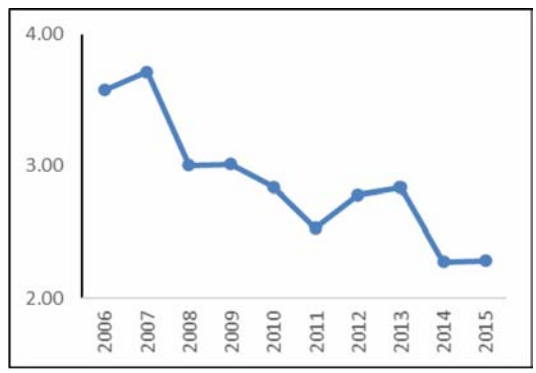


Graph 2: Broad Money Velocity

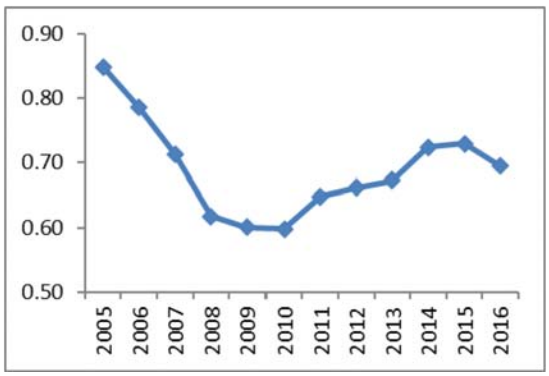
2(a) Unites States



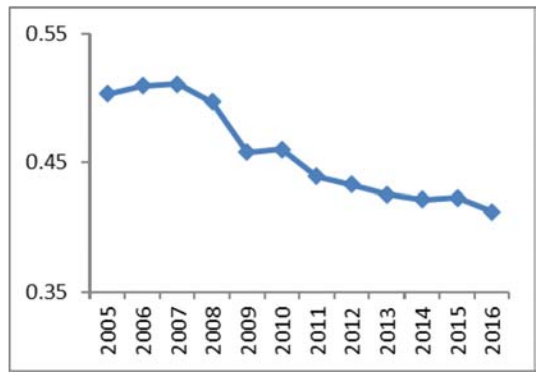
2(b) Eurozone



2(c) UK



2(d) Japan



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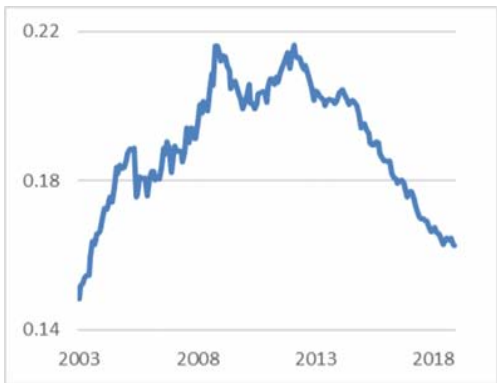
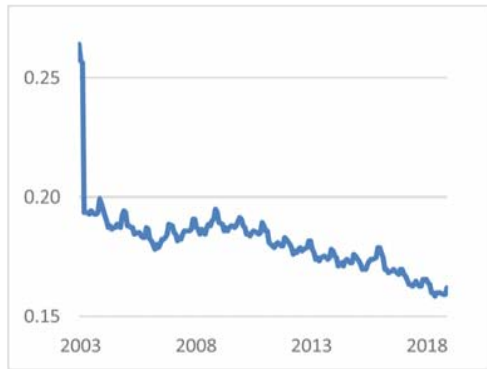
Graph 3: Currency to Demand Deposits Ratio

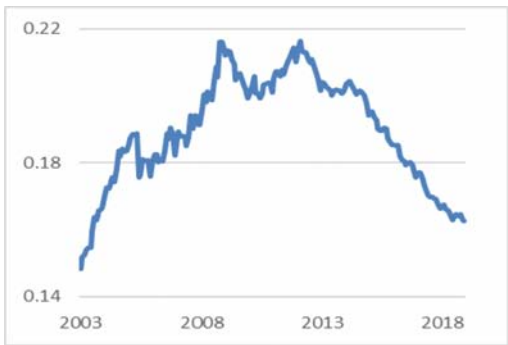
3(a) US



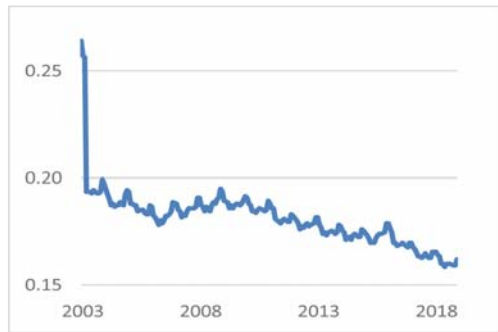
3(b) UK



3(c) Eurozone



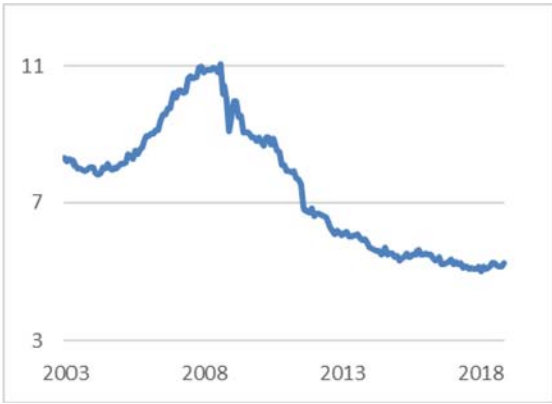
3(d) Japan



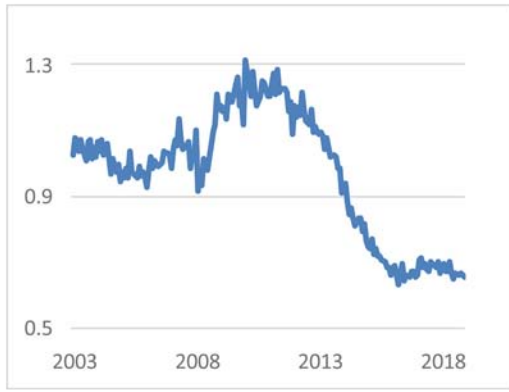
Source: Thomson Reuters

Graph 4: Demand Deposits to Time Deposits Ratio

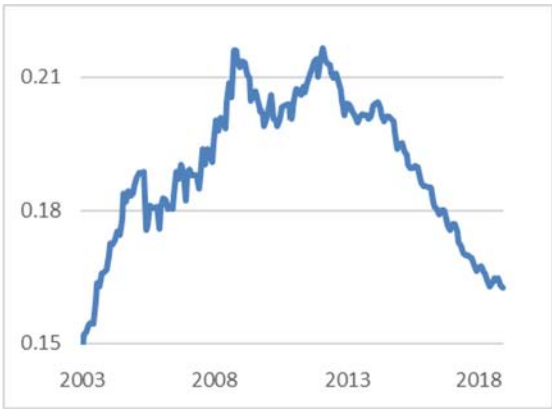
4(a) US



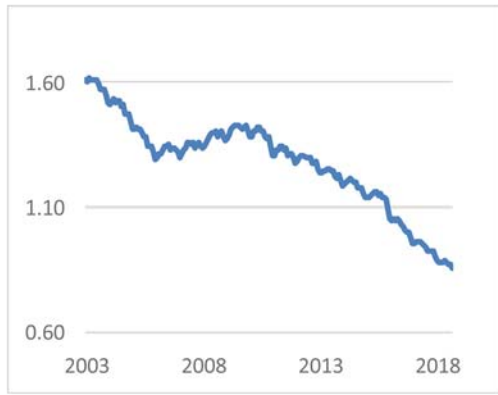
4(b) UK



4(c) Eurozone



4(d) Japan



Source: Thomson Reuters

Table 11: Yield Curve Movement

(a) USA

	1 Year	**10 Year**	**30 Year**
2005	3.59	4.28	4.38
2010	0.31	3.21	4.25
2015	0.32	2.14	2.84

Source: http://www.yieldcurve.com/marketyieldcurve.html

(b) UK

	1 Year	10 Year	30 Year
2005	4.29	4.35	4.32
2010	0.65	3.47	4.29
2015	0.45	1.81	2.52

Source: http://www.treasury.gov/resource-centre

(c) Eurozone

	1 Year	10 Year	30 Year
2005	2.21	3.38	3.89
2010	0.93	3.59	4.0
2015	-0.10	1.18	2.02

Source: http://datamarket.com/euro-yield-curves-daily data

Table 12, reproduced from Goodhart (2013) p.1-15 provides strong evidence on proposition (ii) and (iii) above that are derived from the illustrations in Tables 8 and 9. The increase in the stock of high powered money consequent upon QE and TARP has been offset by increases in the reserve money instead of passing into increased bank lending both in the USA and the Eurozone and caused their money multipliers to collapse (Table 12c). The rapid declines in both the velocity of money (Graph 3) and the money multiplier imply a decline in the efficacy of expansionary monetary policies to remedy the recession. This is inspite of the fact that a significant portion of the TARP funds took the form of foreclosure assistance and direct purchases of mortgage related securities and substantial loan guarantees. In addition, to encourage bank lending to the private sector, the Funding for Lending Scheme (FLS) was put in the place under which additional bank lending to the private sector could be refinanced cheaply from the public sector. None of this worked. Banks held on to excess reserves and held them with the Central banks. The policy responses to this 'return flow of reserves' in Europe and Japan and the USA have been diametrically opposite of one another. Europe and Japan adopted a negative interest rate policy to disincentivize banks from placing reserves with their central banks and lend them into the economy instead. But U.S. began paying a higher than market interest rate on excess reserves causing a collapse of the Fed Funds market [Selgin 2017]; the US central bank has refashioned itself as the borrower of the first resort but those of Europe and Japan have become borrowers of the last resort! Be that as it may, excess reserves continue to be carried by banks to this day.

Table 12: Effects of QE and TARP

(a) USA

	H	R	R/D	M3	Bank lending to private sector	m = M3/H
06 Q2	804	45	0.8%	6784	5620	8.43
12 Q2	2619	1566	18%	9892	7070	3.77
% change	226	3380	-	46%	24%	-

(b) Eurozone

	H	R	R/D	M3	Bank lending to private sector	m=M3/H
06 Q2	727	159	1.2%	7344	8679	20.67
12 Q2	1756	1087	6.2%	9604	11161	7.02
%change	142%	584%	-	31%	29%	

(c) UK

	H	R	R/D	M3	Bank lending to private sector	m=M3/H
06 Q2	68	23	2.44%	1406	1761	20.67
12 Q2	295	232	17.6%	2073	2308	7.02
%change	334%	909%	-	47%	31%	

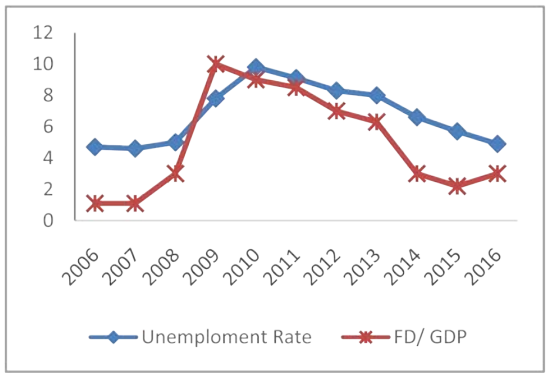
Source: Goodhart (2013). The ratio of bank lending to the deposits portion of M3 seems to exceed 1 by a large margin in the Eurozone and UK but that could be because of other bank liabilities and off-balance sheet sources of finance.

Graphs 2(a) to 2(d) show the behaviour of the velocity of money in US, Eurozone, UK and Japan. In all cases they show declines in perfect agreement with the theoretical propositions illustrated in Tables 3 and 7.

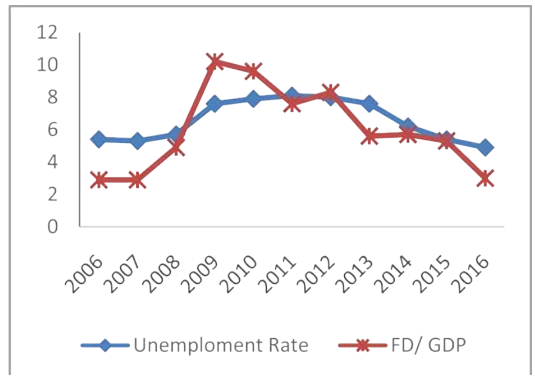
Graphs 4(a) to 4(e) depict the relationship between deficit financing and the unemployment rate from 2006 onwards. Arestis and Sawyer (2010) p. 327-346, have recorded the dramatic change in attitudes as towards fiscal policy post 2007-08, when all the crisis-affected countries completely abandoned the rules of fiscal policy that they had formulated for themselves such as fiscal deficit and public debt not to exceed 3% and 60% respectively of gross domestic product. And none of their fears about fiscal deficit leading to upward pressures on interest rates or crowding out private investment have materialized.

Graph 5 Unemployment Rate, Fiscal Deficit to GDP ratio

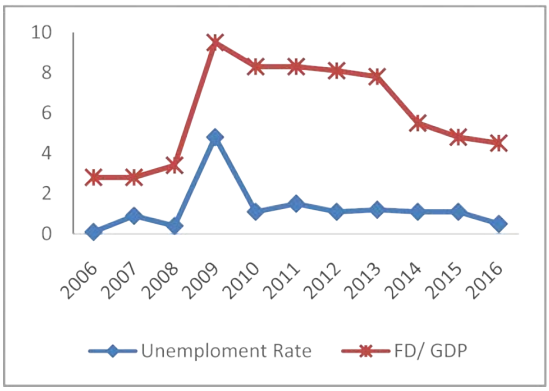
5(a) US



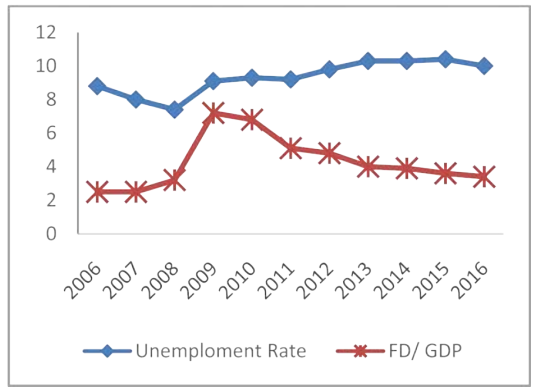
5(b) UK



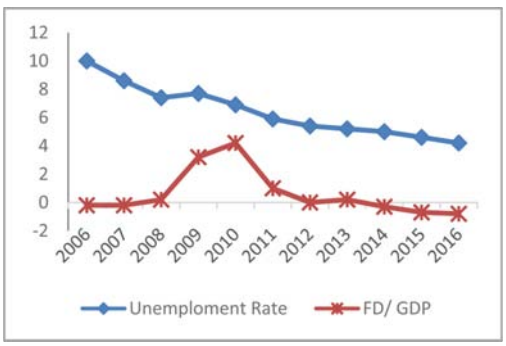
5(c) Japan



5(d) France



5(e) Germany



www.worldbank.org, www.tradingeconomics.com

During the crisis years government deficits were divided in two parts, one part consisting of financial bailouts by means of bad asset purchases and the second part consisting of transfers to low-income households, consumption subsidies and expenditure on investment and infrastructure [See Nachane (2018) pp.134-6 and 146-7]. This second part had the effect of bringing down the unemployment rate stated in (iv) and derived from Tables 4, 5 and 10. In the cases of US, UK and Japan the unemployment rates follow the fiscal deficit to GDP ratios almost step by step.

Table 13: Average Unemployment Benefit and Minimum Wages

Country	Currency	Unemployment Benefit (per week)	Min Wage per week (per hr*8 hr*7 days)	Difference
US	$	323.75	406	82.25
UK	£	65.5	420	354.5
Japan	¥	37470	47488	10018
Germany	€	532.5	495.04	-37.46
France	€	532.5	538	5.5

For Sources:ssa.gov/policy/docs/progdese/sspus/unemploy.pdf,wageindicator.co.uk/main/advice/social-security/unemployment benefits,oecd.org/els/soc/29734836.pdf, ssa.gov/policy)docs/ progdesc/ssptw/2016-17/Europe/spain.html

In contrast, with the experience of US, UK and Japan the cases of Germany and France do not exhibit any effect of deficit financing on reducing unemployment. In all likelihood this is due to the generous unemployment benefits that prevail in the two countries. Table 13 gives an idea of the average size of the unemployment benefit in relation to the going wage rate. [It is well to point out that the figures in Table 13 are aggregates; the actual payouts of unemployment benefits follow very detailed and disaggregate structures]. It is clear from the relative sizes of these that unemployment does not imply as serious a loss of livelihood in Germany and France as it does in the other countries. That is the reason unemployment does not decline even when job offers are created at the going wage rate by means of deficit financing – workers prefer the unemployment benefit obtained by not working to the prospect of working for a low wage rate. Thus the reduction in the unemployment rate in Germany is chiefly the result of the implementation of Hartz reforms and decentralization of wage-setting processes. [See Dustmann et. al. (2014) for details]. France has not as yet undertaken anything similar to the Hartz reforms thus far but is contemplating some reforms.

8. Concluding Remarks

The principal objectives of this paper have, I think, been achieved. Firstly, it has been shown that money is an essential addition to a general equilibrium model of a realistic barter economy In the setting of a realistic barter economy, the use of money promotes economic efficiency by minimizing transaction costs and allows the economy to deliver greater outputs at lower real prices (higher real wages) as compared to a barter economy. Secondly, monetary general equilibrium has been shown to exist if and only if no part of the proceeds or income from the sale of currently produced outputs is hoarded in the form of money. Failing this condition there is general disequilibrium in which at least one market, in particular the labour market, will fail to clear - there will be an excess supply of labour which, in value terms, exactly equals the excess demand for money. The levels of production, income and employment directly depend upon the sizes of sales volumes. An excess demand for money causes sales to decline and along with that the levels of commodity outputs and employment. No amount of flexibility in the prices, outputs, or the wage and interest rate (all of these are unknowns of the systems of equations in this paper and, therefore, are perfectly flexible) is able to remedy the disequilibrium. The only remedy is deficit financing. As the discussion in the paper and the numerical illustrations clearly demonstrate, money is non-neutral(8) . Thirdly, the impact of the policy of quantitative easing has been shown to be limited to cleaning up the balance sheets of banks; it is doubtful if it can go beyond that when industries are undergoing a recession. Some of the theoretical propositions pertaining to the behaviour of the velocity of money, the currency to deposits ratios and the money multipliers and the inability of banks to stimulate private sector lending inspite of large infusion of funds under QE and TARP and finally the impact of deficit financing on the unemployment rate in economies undergoing sharp recessions have been put to empirical test against the actual experience of the Great Recession that started in 2007. Szilard, Gilman and Kejak (2010) p. 1919-2004 and Anderson, Bordo and Duca (2017), p. 32-49, are two recent papers that present detailed data on the declines that take place in the velocity of money during recessions and crises. The evidence is largely supportive of the propositions. Essentially the same phenomena, viz. increasing currency to deposit ratios, declining velocities of money, excess reserves with banks, increasing unemployment rates were experienced during the Great Depression which have been extensively documented and need not be rehearsed here. Exceptions undoubtedly exist, eg. the response of the unemployment rate to deficit financing in Germany and France is out of line with the proposition – but they have credible explanations.

In closing this paper it would be appropriate to point out two limitations models investigated in this paper. The first limitation is that the models pertain to stationary economies with a zero growth rate. The second limitation is that the model determines

only a single rate of interest whereas the real world is characterized by several rates belonging to a single term structure of interest rates. Surely a model that allows new investment and growth to take place and incorporates a term structure of interest rates based on fund-based considerations would yield more realistic insights. Surely a model a) that allows positive new investment and growth to take place and b) one in which the structure of interest rates is determined on fund based considerations in addition to cost-based considerations would yield even more realistic insights.

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