

Mekal Insights

An Interdisciplinary Peer-Reviewed Biannual Research Journal

Year 12 Vol. IV, Issue 1

January - June 2020



Indira Gandhi National Tribal University

Amarkantak, Madhya Pradesh

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प्रो. श्रीप्रकाश मणि त्रिपाठी
कुलपति
Prof. Shri Prakash Mani Tripathi
Vice-Chancellor

Date : 21.06.2020



Message

'Mekal Insights' is ready with its reincarnation. The Journal is an official publication of the Indira Gandhi National Tribal University. It is a peer-reviewed, multi-disciplinary Journal having the broad objective to encourage research and publications in the country with special focus on the region.

The need for a journal of this kind was deeply felt, as disjointed scientific communities in the region were working for independent goals having no platform for exchange of ideas and research output. The Journal aims to foster a wider perspective including all the branches of Science, Social Sciences, Humanities and Business Management. With a multi and inter-disciplinary approach, the Journal will prove fruitful for the rich but unraveled geography of the region. The Journal welcomes cutting-edge research studies in similar settings having a strong empirical or theoretical foundation beyond the geographical limits of Central India.

There is an apparent need to encourage researches and research writings amongst academic communities. I wish, the Journal would organize and collaborate with symposiums and workshops in diverse fields of knowledge and strengthen the capacity of young researchers. This, on one hand, would open publication-opportunities for the participants of conferences and on the other, augment the efforts of the organizers in the publication of the proceedings.

The automation of the Journal management and a dedicated webpage on the university website is in place to help the Journal reaching out to diverse audience. Papers published in the Journal will also have the online content available on the dedicated webpage. Plans are also underway to have a separate link for blogging, in which individual authors can view the comments and respond to their papers in an open forum. The Journal is open to affiliations with eminent publishers and societies for effective branding and extended reach.

The current-issue includes several seminal papers from a variety of fields including Political Science, Geography & Earth Science, Philosophy, Anthropology, and many other branches of study. They define the face of the Journal and set the stage for subsequent issues.

Having eminent researchers from across the globe in the advisory board, efficient editorial team and in-house editing facilities, I see a bright future ahead for the journal. I take this opportunity to congratulate the editorial team for working hard to revive the Journal into more vibrant appearance.

I wish the Journal all success.

(Prof. Shri Prakash Mani Tripathi)

Editorial

It is my pleasure and privilege to present this rekindled issue of ‘Mekal Insights’. The research journal ‘Mekal Insights’ of Indira Gandhi National Tribal University, Amarkantak is a peer-reviewed, interdisciplinary and bi-annual research journal publishing high-quality manuscripts in almost all fields of Science, Social Sciences, Humanities and Management.

The Journal follows a double-blind peer-review process. The process constitutes an initial similarity-check through the computer software using a five-word combination. The authors are communicated about the initial screening in case the article exceeds a ten-percent in overall similarity. The shortlisted articles are then sent to two external reviewers who review the articles for their presentation style, language, novelty, originality, relevance and advancement of knowledge in the field of study. The reviewers are carefully chosen for their expertise in their respective disciplines and having sound knowledge in the domain of the article. The review comments are subsequently shared with the authors for incorporating changes, if any. At this stage of screening, articles are shortlisted only when both the reviewers have recommended the article for publication. The articles for the Journal thus, traverse through a rigorous process of review before selection.

The present volume consists of ten articles including a book review from a variety of disciplines such as; Sociology, Anthropology, Geography, Geology, Philosophy, Political Science, Science and Education. The first article makes an attempt to analyse the prospect of global citizenship as an idea to cope with the crisis of migration and humanitarian problems. The second article makes comparative study of heat values of bituminous coals from Barakar Formation of Gondwana Basins. The outcome of the paper may contribute to the geochemical characterization of the coals in terms of their heat values, understudy. The third article delves into the major contours of the Indian foreign policy in the contemporary world. The article is a narrative of a systematic shift from non-alignment to multi-alignment that has put India in a predominant role in the various regional and global organizations and institutions. The fourth article examines the relationship and finds varied-degree of organizational commitment and job satisfaction amongst corporate male and female engineers.

The fifth paper is an attempt to study the histogenesis pattern of the Amarkantak town with reference to the development of residential areas and the establishment of social, cultural, religious, and economic institutions. The sixth paper using a mixture of empirical and doctrinal research methodologies observed the persisting gender gap in the Indian patent regime and considers it to be detrimental to both the career of women and to society. The paper advocates for revoke of the contemporary patent laws to address the gender gap. The seventh paper aspires to achieve gender equality and strengthened Indian society through the thoughts and philosophy of Vivekanand. The

eighth paper highlights the new education policy, in promoting the Indian traditional knowledge such as; necessary aspects of human life, sustainable life in harmony with the environment, the lost value of traditional knowledge, and the government initiatives to assimilate these into the formal education system. The ninth paper makes an attempt to study the change of environment and its effect on the natural resources management by the Baiga tribes of Chhattisgarh. The tenth contribution is a book review on 'Head Hunters Culture- Historic Culture of Nagas', originally written by Joseph S. Thong. (2012). The Journal is thus structured into ten papers.

I owe a special word of thanks to our Vice Chancellor Prof. Shri Prakash Mani Tripathi for his continuous support, motivation and encouragement to bring out this renewed issue of Mokal Insights. I extend my sincere thanks to my editorial team and all the anonymous peer reviewers for their untiring efforts, insightful remarks and valuable suggestions. While I hope this volume will kindle interest and motivation amongst researchers and readers, I invite you all to contribute relevant and diverse contributions for the forthcoming editions.

Lastly, I look forward to your suggestions, comments and observations to the authors and to the editorial team to continually upgrade this Journal based on emerging trends in scientific research.

Prof. Alok Shrotriya

Chief Editor

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Migration, Security and Global Citizenship

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Abstract — Migration has always been the issue of debate amongst policy makers and academia. The different stakeholders have their own viewpoint on the issue of migration depending upon their status and interest. The heavy influx and migration of people from Afghanistan, Myanmar, Syria, Libya and other countries in Europe; idea of creating Mexico Wall by the US and many more issues of immigration make this time opportune to rethink over the idea of global citizenship. Can the idea of global citizenship be an answer for these global problems? Is the idea of global citizenship a pragmatic idea or a utopia? Can we as political entity transcend our geographical, cultural and social boundaries? How notion of security- internal and external- is affecting the idea? Can the idea of spirituality be extended to the idea of citizenship to cope with the many issues we are facing in the present scenario? Is there any applicability of philosophical ideas of Maharishi Aurobindo and *vasudhaiv kutumbkam* in attaining world order? In this wake, this paper will make an attempt to analyse the migrant crisis and prospect of global citizenship as an idea to cope with such kind of exceptional humanitarian problems.

Keywords: *Migration, Security, Global Citizenship, Vasudhaiv kutumbkam, Marginalization, Cosmopolitan*

*Lord Thou hast willed, and I execute,
A new light breaks upon the earth,
A new world is born.
The things that were promised are fulfilled.*

Sri Aurobindo

(Mother's Prayers and Meditations, 24 April 1956)

The heavy influx and migration of people from Afghanistan, Myanmar, Syria, Libya and other countries in Europe; idea of creating Mexico Wall by the US and many more issues of immigration make this time opportune to rethink over the idea of global citizenship. Can the idea of global citizenship be an answer for these global problems? Is the idea of global citizenship a pragmatic idea or a utopia? Can we as political entity transcend our geographical, cultural and social boundaries? How notion of security- internal and external- is affecting the idea? Can the idea of spirituality be extended to the idea of citizenship to cope with the many issues we are facing in the present scenario? Is there any applicability of philosophical ideas of Maharishi Aurobindo and *vasudhaiv kutumbkam* in attaining world order? In this wake, this paper will make an attempt to analyse the migrant crisis and

prospect of global citizenship as an idea to cope with such kind of exceptional humanitarian problems. Through this paper, some questions are raised and analysed for which additions are welcome from any corner. Migration in general shares some basic themes such as displacement, adjustment, and cross-cultural tensions. Migration is neither a new phenomenon, nor an extraordinary event which affects the global and regional politics first time in such a manner. In fact, migration in itself is not a big problem but it essentially creates havoc when compounded with large number (and now it is in millions) and arises because of political reasons. The United Nations defined migrant as a person who moves to a country other than his or her usual residence for a period of at least a year and short-term migrant as a person who moves for at least three months but less than a year (UN Recommendations on Statistics of International Migration, 1998).

The United Nations has estimated that there were 258 million immigrants in the world in 2017 (United Nations International Migration Report, 2017). On 19 September 2016, the General Assembly held a high-level meeting on addressing large movements of refugees and migrants, at which the New York Declaration for Refugees and Migrants was adopted. In the Declaration, Member States reaffirmed the need to protect the human rights of all refugees and migrants, regardless of their status (United Nations International Migration Report, 2017). The global compact on refugees seeks to share the burden and the responsibility of hosting refugees and funding refugee programmes more equitably. It will be guided by the 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda. During its 71st session, the General Assembly decided to hold future high-level dialogues on international migration and development on a quadrennial basis, with the Third High-level Dialogue on International Migration and Development to be held during the first half of 2019. As envisioned in the New York Declaration, these periodic high-level dialogues may play a role in reviewing the implementation of the global compact for safe, orderly and regular migration (United Nations International Migration Report, 2017).

The whole world is on move, but this excessive number creates imbalance in this move and leads to so many vicious circles of problems. In this wake, efforts will be made to analyse the migrant crisis and prospect of global citizenship as an idea to cope with such kind of exceptional humanitarian problems. How the issue of migration affects the national security issues and make adverse impacts on the available scarce resources within the sovereign territory of a nation will also be tried to be investigated in the present paper. Are the efforts of the UN enough to tackle the issue of migration worldwide or something else is required to tackle the issue? How the religious radicalism and violence complicate the issue of migration and make its adverse impact on the internal and external security issues along with making its impact on the prevalent socio-cultural structure of society? Do the philosophical insights of *vasudhaiv kutumbkam* and ideas of Maharishi Aurobindo make any impact? And, whether the world is ready to move further towards its further stage of development, which is just unfolding of the stages of development as Vedas and Indian philosophy proclaims? Can the idea of spiritual citizenship be an alternative for political citizenship? And how the cosmopolitan characters of world order is attained?

Migration has been a feature of human behaviour since pre-historic times. Evidence points to the origins of modern humans in Africa followed by their spread to other regions of the world. It is apparent that *Homo sapiens* have spread from a point or points of origin to different parts of the world (Martins et al., 2018). Migration arises because of many sets of factors whether push factors (Boswell and Crisp, 2004) (reflect the physical, social and economic environment at source) for the subsistence, pull factors (Boswell and Crisp, 2004) (incentives posed by destination having economic overtone)

attraction for better living conditions, economic reasons or any other reason; it brings and covers many dimensions ranging from socio-political to economic and cultural. It also brings its impact by virtue of cause of migration to origin and destination places also. Whatever is the factor of migration, nature and policy of immigration and emigration based on the carrying capacity of state, decides the status of migrants in host countries.

Along with many theories of migration, one of the major push factors for migration is violence and terrorism which force people to move for the sake of survival leading to demographic imbalance and trauma. The intolerance, radicalism and violence in the name of particular religion; trying to make homogeneous society and state is big challenge for and from migration. This type of violence and intolerance leads to (forced) migration and at many times, they perceived as security threats for so many reasons. This type of migration occurs mostly in the regional domain, whether within boundary of state or across the neighbouring states bringing with it serious security implications and threat perception along with socio-cultural divide. Forced Migration of Kashmiri Pandits from the Kashmir valley region because of violence and terrorism make them refugees within their own country, still waiting after so many decades for the favoring atmosphere to return back to their own places. Migration of Bangladeshi refugees, migrants from Myanmar, Afghan people, Syrians and many more are example in the endless series. There is distinction between forced and voluntary migration. Most of the time forced migration arises because of push factors and voluntary movement because of pull factors. Forced migration is unlikely to benefit those who are forcibly transported. Those who left behind may suffer from the loss of economic and physical protection provided by those who leave. Forced migration may also have a structural demographic impact. They leave behind females and older males and lead to an inverse imbalance at the point of destination (Martins et al, 2018). Migration and refugees from pogroms, invasions, intolerance and civil unrest also pose important socio-cultural and economic questions. Here the idea of spiritual citizenship with unity in its diversity may bring some answer to this religious animosity. In fact the intolerance in the name of religion can be minimized through spiritualism only and it should be extended to enlarge the domain of political citizenship. The Indian philosophy of *vasudhaiv kutumbkam* and ideas of unfolding of human stages to move towards internationalism propounded by Maharishi Aurobindo give us insights to make this world order somewhat better than what it is today. If it is unfolding of layers of development: from individual to family, family to society, society to nation; whether this unfolding will move towards internationalism? Religious divide can be bridged through spiritual unity, by maintaining the heterogeneous character of society too. Extension of spiritualism to citizenship is not against the concept of secularism, in fact in other sense it supports true notion of secularism too. There may be different possible models for cosmopolitan world order:

- Heterogeneous world unit with distinct nationality and state structure with spiritual unity of individual is at core.
- Democratic world model having region as its unit.
- Spiritual Citizenship with spiritualism as unity force for the whole world.
- Sharing of resources and opportunities as a unit of common world order (European Union model).
- Transitional Global Citizenship under the global international agency like the UN.

There may be other alternatives too, which may be based on the prevailing these circumstances and situations. Along with these possibilities there are certain concerns for attaining the world order

are also there, rather with its comparatively deep intensity and encroachment on the societal order:

- Security issues and threat perceptions
- Violence and radicalism in the name of religion.
- Motives related with politics and power.
- Divide on the Economic plane and
- Sharing of limited resources and opportunities.

In present circumstances there is cry everywhere in the globe to tackle the largest humanitarian crisis which arises out of the different forms of militancy for the sake and name of different reasons in the form of terrorism, insurgency, etc. Without tackling the issue of security and order, the achievement of orderly society is not possible in any case. Every region has its own set of issues which defines the nature and extent of problem along with the capability of political regime to tackle these kinds of issues, but somewhere there linkage is also visible. ISIS, Al Qaeda, Taliban, insurgent groups in Kashmir, many parts of Africa and Latin America and many more like these; fighting to gain not only power or for political reasons (which might be possible amicably through political means) but are trying to create a reign of terror, using inhuman means of terrorism in the name of different false ideological perceptions. This issue has transcended the boundary and domain of individual state to global level. These new sets of ever complicating problems are new and ever bigger threats for the humanitarian existence.

But question here is whether, we are ready to move ahead of our politico-geographic and socio-cultural boundaries of different kinds? Global humanitarian intervention is required to combat the menace of terror, which is not a law and order problem; but a threat for humanity and challenge for global peace and development. In order to attain the peaceful world order with idea of global citizenship enshrined in the notion of *vasudhaiv kutumbkam*, international community should take appropriate measures with full unity at appropriate time to curb the menace of terror. The policy, action and the funding of deep states in different national boundaries must be tackled by national governments in order to keep their sovereignty intact and inalienable. The security of boundaries and individuals is possible only when the threats perceived across the boundaries get curbed and eliminated, not by using these threat perceptions as a deep state policy. The principle of common but differentiated responsibilities is the bedrock of collective enterprise.

The discourse of security issue is *sine qua non* to move ahead for the development, peace and idea of global citizenship which ensures dignity and rights of human being to every individual in globe. As law and order along with the security of individual being is the pressing criterion for the sake of which state comes into existence granting citizenry rights to the people in its domain. It is equally important that in moving towards the concept of global citizenship, the global problem of terrorism along with other global problems is to be dealt with in proper manner by the global institutions in multifaceted dimensions to ensure the safety of human beings globally.

Problems, which cross the boundaries and limits of state, should be dealt with globally and the institutions rectified accordingly. Prime Minister Narendra Modi pitched for reform of the powerful world body of the United Nations to make it “broad-based”, saying it is essential to maintain its credibility and legitimacy in the current world realities. Rather than, the world having different Groups (Gs) and divided into compartments, the UN should work as G-All (Group for all). In order to make it more effective for the 21st century, it should come out from the imperatives of the 20th century, in which it had been made. Humanity has progressed when it has collectively risen to its obligation to

the world and responsibility to the future (https://www.huffingtonpost.in/2015/09/.../narendra-modi-un-speech_n_8199442.html). Modi put it very strongly at the forum of UN that, UN lacks the strategy and method to tackle this global problem because approach of the UN is still the same as of 1945, when it was founded to prevent the humanity from the scourge of war. War and terrorist activities are two different things and we have to learn to wage a war against this terrorism in its peculiarity without discriminating between my problem and your problem, rather the best way to tackle it as 'our problem'. Prime Minister Modi said that, "terrorism is appearing in new form and no nation is free from it (<https://timesofindia.indiatimes.com/prime-minister-narendra-modis-maiden-speech-at-un-generalassembly/liveblog/43624037.cms>)" When this problem has its multifaceted global dimensions from financial funding to illicit political funding, we have to create the multifaceted approach too, to tackle this issue. We have to find out some universal approach to save the humanity not only from the scourge of 'war' but the 'act of terrorism' too. The scope of humanitarian intervention for peacekeeping agenda should get extended and get enlarged to cope up with terrorism in its various dimensions. We should first be treated as important individual unit of this globe; irrespective of our state, religion, race, caste or origin of any kind. Now, the time has come that, despite being considering state as its important constituent, individual be treated as global unit with the *global citizenship* making this world a confederation of state units under the aegis of United Nations, in its new form and approach leaving no place for any kind of inequality or domination. We live in an age of unprecedented prosperity, but also unspeakable deprivation around the world. Elimination of poverty in all forms everywhere is at the top of our goals. Addressing the needs of 1.3 billion poor people in the world is not merely a question of their survival and dignity or our moral responsibility. It is a vital necessity for ensuring a peaceful, sustainable and just world (https://www.huffingtonpost.in/2015/09/.../narendra-modi-un-speech_n_8199442.html). There is no cause greater than shaping a world, in which every life that enters it can look to a future of security, opportunity and dignity; and, where we leave our environment in better shape for the next generation (https://www.huffingtonpost.in/2015/09/.../narendra-modi-un-speech_n_8199442.html).

The idea of this global citizenship is very much imbedded in *vasudhaiv kutumbkam* (to treat entire world as family) approach. Some concerns may and should arise, that whether this idea of global citizenship is feasible concept or a kind of utopian idea. Here it seems pertinent to refer to the concept of a kind of regional citizenship, which has initiated in the form of European Union citizenship. Need of the hour is, not only to strengthen the concept of this regional citizenship in every part and region of the globe but to expand it to the global level. Means of the communication, information technology and new set of developments in the present scenario are the carriers of this change as it has been done earlier during 17th & 18th centuries particularly in Europe to rebuild nation-states and through defining individual rights in the wake of Renaissance and humanism. Again this mode of communication in its varied forms are creating new constituencies of global citizenship arising may be because of better economic opportunities and quality of life. Adding the aspect of tackling terrorist activities requires this idea to be consolidated in more concrete form as global citizens to cope with this issue.

Why Global Citizenship?

It is undoubtedly clear that, worst victim of terrorism and insurgent activities are women and children along with the old-age people. For the sake of better opportunities for the family, migration is bound to happen whether it is legal or illegal. Labour surpluses and shortages have resulted in push-pull factors influencing migration. Legal restrictions imposed by receiving countries can lead to people smuggling and trafficking (UN International Migration Report, 2002). Threats to survival whether in

form of violence, terror activities, lack of development, education, health and access to resources for the sake of growth, denial of the basic needs are compelling forces of migration, whether it is internal migration or external. The incident of drowning of Aylan Kurdi and helplessness of the family shook the whole world and compel us to rethink over our boundaries and policies on migration. It is equally true that, these migrations lead to burden and pressure on the receiving and creating so many problems whether social, political or economic. Huge Migration of Bangladeshi people to India during 1970s leads to Indo-Pak war, heavy influx of Syrian, Afghani and African people in different states of Europe create so many complex issues to tackle and leads to divide European people ideologically on two poles – one in favour of migration on humanitarian ground the other against this migration claiming the limited resources of theirs. The Syrian conflict has become the new battleground, making it complex with so many parties as the claimant of power or trying to be in commanding position having the backing of powerful blocs, mainly the present regime of Al Basar, rebellious group to change the present regime and making it a triangle with Islamic State of Iraq and Syria (ISIS) group a terrorist organization having hold on many regions of Syria and terrorizing the world with terrorist activities in the name of creating Islamic state worldwide. The impact of this conflict is so devastating that lakhs of Syrians became the victim of this conflict and lost their lives, millions of Syrians migrated legally or illegally towards other places or are bound to live in refugee camps with miserable conditions and still the migration is on the move towards different parts of Europe and America.

According to UN International Migration Report 2017 Highlights, over 60 per cent of all international migrants live in Asia (80 million) or Europe (78 million). Northern America hosted the third largest number of international migrants (58 million), followed by Africa (25 million), Latin America and the Caribbean (10 million) and Oceania (8 million). In 2016, the total number of refugees and asylum seekers in the world was estimated at 25.9 million. Turkey hosted the largest refugee population worldwide, with 3.1 million refugees and asylum seekers, followed by Jordan (2.9 million), the State of Palestine (2.2 million), Lebanon (1.6 million) and Pakistan (1.4 million) (United Nations International Migration Report, 2017). In 2017, India was the largest country of origin of international migrants (17 million), followed by Mexico (13 million). Other countries of origin with large migrant populations include the Russian Federation (11 million), China (10 million), Bangladesh (7 million), Syrian Arab Republic (7 million) and Pakistan and Ukraine (6 million each) (United Nations International Migration Report, 2017).

States of European Union became the obvious choice for these migrants, because of its geographical proximity and availability of better conditions of life. But this too has strained the resources of these states and new type of conflict has surfaced between migrant or migrant supporters and opposing groups. The concerns of opposing groups are genuine and obvious too, but here the bigger question is whether these poor Syrians are part of humanity or not? And if they are; do they have the natural right to live? Where is the place for them on this globe? If UN is the custodian of humanity, why not UN is taking concrete steps to prevent this worst humanitarian crisis ever? If the state and political structure of Syria failed in providing and securing the very basic right of these people why not UN in the name humanitarian intervention intervene in it to restructure it? “The Syria crisis has become the biggest humanitarian emergency of our era, yet the world is failing to meet the needs of refugees and the countries hosting them”, the UN High Commissioner for Refugees António Guterres said in 2014 (https://en.wikipedia.org/wiki/Refugees_of_the_Syrian_Civil_War). The UNHCR reported that the total number of refugees worldwide exceeds 50 million for the first time since World War II, largely due to the Syrian civil war (https://en.wikipedia.org/wiki/Refugees_of_the_Syrian_Civil_War).

In 2016, from an estimated pre-war population of 22 million, the United Nations (UN) identified 13.5 million Syrians requiring humanitarian assistance, of which more than 6 million are internally displaced within Syria, and around 5 million are refugees outside of Syria. The vast majority of the latter are hosted by countries neighboring Syria. Among countries of the Regional Refugee and Resilience Plan (3RP), a coordination platform including neighboring countries (with the exception of Israel) and Egypt, the UN Refugee Agency (UNHCR) counted 5,165,502 registered refugees, as of August 2017. Turkey is the largest host country of registered refugees with over 3.5 million Syrian refugees. The UNHCR counted almost 1 million asylum applicants in Europe, as of August 2017 (https://en.wikipedia.org/wiki/Refugees_of_the_Syrian_Civil_War).

Many of the European states like Hungary, Germany and Czech Republic suspended the *Dublin Regulation* to process asylum applications in this extraordinary situation. The Dublin Regulation (Regulation No. 604/2013; sometimes the Dublin III Regulation and Dublin Convention) is a European Union (EU) law that determines which EU Member State is responsible for the examination of an application for asylum, submitted by persons seeking international protection under the Geneva Convention and the EU Qualification Directive, within the European Union. The data indicate that, United States was the largest host country with 19% of the world migrant population in 2015. Traditional receiving countries such as Canada (3%) and Australia (3%) have significant but comparatively low in world migrant population. However, European countries that in the past were senders of people became large hosts in more recent decades, such as Germany (5%), United Kingdom (4%), Spain (2%) and Italy (2%). Russia (5%), Ukraine (2%) and Kazakhstan (1%) being large hosts to migrants from previous Soviet Republics in 2015. Saudi Arabia (4%) and United Arab Emirates (3%), two major oil producing countries had large migrant worker populations. India (2%) and Pakistan (2%) have been hosts to refugees from neighbor countries due to social disruption and wars (Martins et al., 2018).

These issues are not important only for the Syria to be solved as soon as possible but for the whole globe and especially Europe. Are we not moving towards creating new set of problem like Palestine and Israel as the outcome of migration of Jews people during Second World War? Where are the homes for these homeless and stateless people? Who is fighting for whom? If the very existence of the state is in danger, from where does the power flow from? Peace talks and ceasefire became victim of the politics of in-groups and of the major blocs keeping interest in the area because of the strategic and economic reasons. Governments of the North are stymied, and their citizens are also divided as to how to react: with a pathway to citizenship or harsher immigration laws, guest-work programmes or heightened border security, comprehensive immigration reform or tighter borders that include a 1900 – mile wall between the United States and Mexico? (Loustaunau and Shaw, 2018) Millions of undocumented individuals living in the United States remain in limbo, hoping for a fair and just outcome that takes into account more than simply their legal status (List, 2018).

Here a pertinent issue is that, the process for amicable political solution must continue but at the same time these people may be granted *transitional global citizenship* (till any solution is reached) with certain rights granted by the UN, by which they may at least have some employment prospects and have the natural right to live on this globe. Some concrete plan and policy should be designed by the UN to prevent this kind of situation to happen anywhere in the world. The new kind of approach and redesigning of the UN is necessitated to cope up with this kind of situation, where democratic values should be given preference rather than the veto system. The efforts for new approach of global

citizenship should be initiated, taking European Union as its model based on the principle of *vasudhaiv kutumbkam*. Collective strength of humanity is essential to fight against the enemies of humanity with new kind of emerging threats every day.

Nation-state is not the one and only criterion and site of citizenship where the state accepts certain rights in its legality. David O' Byrne's advocates for "performative citizenship" as a way of creating the future and transition to global citizenship is a necessary development (Nekvapil, 2003). National citizenship demands privileged and equal treatment to its nationals, whereas differential treatment for non-citizens. Notion of global citizenship demands equality and dignity with certain rights for all the denizens irrespective of their origin and citizenship criteria. Though it is equally true that, merely being citizen does not necessarily ensure the equality and dignity for citizens, as many examples are there in which state or state-supported structures not only snatch the rights and dignity of their own people but also risk their survival too making the citizenship criterion of their own; very much futile example of many African ethnic conflicts and the role of state in it, Syrian conflict and role of political system in it, Libyan conflict etc. are only few examples. Apart from this war-torn conflict zones in the states, where political process is not in good tune, many of the groups, peoples or communities did not get their due rights and their dignity always on the stake. In the wake of this situation global citizenship offers new hope and new possibility. Only 3.1 % of the world's population resides outside their country of birth (<http://www.iom.int/jahia/jahaia/facts-and-figures/global-estimates-and-trends>). Citizenship of a "lucky country" is therefore an incredibly valuable commodity, acquired by most on the basis of "a morally arbitrary set of criteria" (Nekvapil, 2009). National *jus solis and jus sanguinis* citizenship laws perpetuate and reify dramatically differentiated life prospects (Nekvapil, 2009). William Blake puts it beautifully, "*Some are born to sweet delight, Some are born to endless night*" (Nekvapil, 2009).

New situations demand new approach and new thinking as humanity always strives for betterment which is proved by the stages of history itself, whether it is political system, citizenship, state, rights, League of Nations and further United Nations, regional organizations like European Union etc. are all examples of it. New kinds of humanitarian approach with idea of global citizenship is to assure every individual that, he or she is very much part of this globe and this global family stands before him or her in the need of hour, at the same time this global citizen should have certain duties and responsibilities towards this globe. This kind of approach may also become useful in dealing with many global issues such as environment.

This definitely spurs the suspicion that how is it possible when state system is already having many sets of complex problems to solve. And here it seems that this idea seems to be a utopia. It is true that, this idea seems to be far away, but the extreme complexities of problems have the potential to bring new approach and ideas to be effective as formation of UN and European Union. This idea of global citizenship will not remove the state structure; in fact it is only possible with strong state structures having global citizenship as transitional stage. State is and will remain the important constituent of this global polity. Global citizenship should be granted as part of the natural right of individual being which may prevent in escalating conflicts at different levels. Plutarch has said, *nature has given us no country as it has given us no house or field*. This notion of global citizenship is very much natural, other structures and identities are artificial or created one. Plutarch urged to be conscious part of wider reality and to exercise imagination to overcome a narrow, localised conception of identity (Nekvapil, 2009).

Millions of Aylan Kurdi are in search of safe route and place on this globe to have their existence. To whom will they ask for their basic human rights needed for their survival? Who will assure them

their citizenry rights in future, if they will succeed to survive? Here the idea of global citizenship is the only ray of hope to save the humanity from these inhumane behaviours, in which structures facilitate and help in their survival with the assurance of their basic citizenry rights.

Economic motivations for migration dominate decision making. Migration for economic reasons are welcomed by receiving countries too because of the wealth and resource creating potentialities of migrant people, coming in filtered way through different channels. These migrants usually enjoy almost all their citizenry and civic rights. The experience in Europe of lower fertility resulted in a lower number of people entering the work force and led to industrialised European countries changing from net losers of people to migration to being net gainers (Martins et al., 2018). It should be recognised that migration in and of itself is not negative since the returning migrants also bring in new knowledge and technology from their communities of origin. This group of returning migrants with knowledge of the outside world and who are proven risk takers could be a key group to be mobilised in the local communities for experimentation and adoption of innovations. The portion of international migrant workers' earnings sent back from the country of employment to the country of origin, play a central role in the economies of many labour-sending countries and have become a focal point in the ongoing debate concerning the costs and benefits of international migration for employment (Puri and Ritzema, 1999). Cost and economic benefit of migration is not unidirectional, but the employment generation migrant receiving state also get benefitted from the migration in the aspect that it gets cheap skilled and unskilled labour, technical expertise along with its market expansion prospects. Diaspora is now playing its vital role in deciding the diplomatic and economic decisions too. Role of migrants as one of the important vital factors playing their role in economic progress of the US, Canada and many parts of Europe is now recognised. Their role becomes so important and crucial in the economic and social progress of the receiving state that, they not only become one of the important issues in political mandates but they are now getting the space in political system too.

But in second case because of its large numbers at one moment, these migrants become a problem and burden for receiving countries having no mechanism to check their movement and judge their credentials. Because of increasing incidents of terrorism, they come under suspicion too. Unbalanced pressure on the limited resources leads to strife and conflict between sons of the soil and migrant people leading to a new kind of struggle. These migrants are mostly poor people compelled to move due to circumstantial conditions of war and conflict. Where is the place for them to live on this globe if they don't have their own soil in their name on this globe to live upon or someone else has captured their share of resources? Here the global society has the equal responsibility and duty to give them some space to live upon for their survival; here humanity should be the prime link which may connect these people. In her *Impossible Subjects: Illegal Aliens and the Making of Modern America*, Mae M. Ngai argues that, "undocumented immigrants are at once welcome and unwelcome: they are woven into the economic fabric of the nation but as labor that is cheap and disposable" (Ngai, 2005). Ngai (2005) calls these individuals who get trapped in this situation as "impossible subjects". Giorgio Agamben use the term "*Bare Life*", originally used by Hannah Arendt, which refers to *life outside of politics*. "Bare Life" in other words refers to those lives that lack any legal or political protection (Agamben, 1998).

Here the idea of *vasudhaiv kutumbkam* presents hope for the humanity where the bare life of individual comes into the family bonding (integrated) at one level and adverse effects of New Economic Policies of LPG be minimised at other level. The idea of *vasudhaiv kutumbkam* is different

from globalization. The philosophy of *vasudhaiv kutumbkam* associates the different cultures and respects the multiculturalism along with some unified bond, whereas globalisation tries to homogenise with deep divisions at every level. Though this idea of global citizenship is practiced in many cases by some section of people worldwide, because of the economic reasons, no matter where they have born and where they are living. Need of the hour is to find out certain mechanism in case of such emergency, where in negligible process, individuals may get the transitional global citizenship authorised from the UN to move to suitable places as per their need and requirement. This idea of global citizenship embedded with the idea of humanity may also work as panacea for the global terrorism, by which the ideas of humanity and humanitarian values may take edge over idea of aloofness and alienation which leads to terrorist and unsocial activities. *Let the humanity unite for the pragmatic need of peace.* Humanity should win to build constituency of peace worldwide. The great example of victory of humanity over conflict and struggle with broad idea of citizenship is European Union, leading to the way of prosperity and peace. In fact the movement of people leads to the movement of potential, resources, energy, aspirations and positivity which leads to the peace. The movement of people helps in maintaining the equilibrium for development. The idea of global citizenship helps in reducing the atmosphere of animosity by creating a plural heterogeneous society with different capacities and energy. Emrys Nekvapil described it beautifully that *global citizenship requires action, not explanation, to manifest. It is something that must be done not described* (Nekvapil, 2009). Rather than theory, action part is more important in context of the global citizenship. Idea of global citizenship invokes to look and think beyond the narrow limited confinement and become part of the broader perspective.

The idea of global citizenship is just progressive movement and extension from the Westphalia notion of state and its legal structured units as citizens. Baha'u'llah, the founder of the Baha'i faith, said "the earth is but one country, and mankind its citizens" (Baha'u'llah, 1976) Kant urges for cosmopoliticum (cosmopolitanism) by extending hospitality to strangers as fellow 'citizens of a universal state of humanity (Cf Linklater, 1999). If the legal status of citizenship is, ideally, an expression of a polity's conception of membership and collective identity with its unifying credentials, we in this era of globalisation, where possibilities and problems, both are global in nature; we need to enlarge our identity and position in global sense with global boundaries with issues and prospects as its unifying credentials. The fundamentals of basic human rights that all humans are born equal in dignity and rights should prevail; irrespective of their birth place or residence or any criteria which leads to marginalisation and exclusion of larger section of humanity. Even the idea of national citizenship should not come in to contrast with this basic idea of global equality; rather it should be redesigned in a manner to assist this phenomenon without compromising with its core values. It is a basic premise of the most human rights treaties to which most of the states adhere that, irrespective of the differences between citizens and non-citizens, everyone should be treated alike. There is no reason national citizenship cannot exist within global citizenship, in the same way that local citizenship currently exists within national citizenship (Nekvapil, 2009). National citizenship and global citizenship "form a continuum whose contours, at least, are already becoming visible" (Habermas, 1996). There is need to strengthen the global institutional mechanisms to protect the dignity and virtue of a global citizen. The possibilities of global citizenship opens up the new spheres of peace and prosperity with a better global world order in which each other's interests are intrinsically associated. The idea of global citizenship will impose legal-moral pressure on state structures and global institutions to protect every individual's life, rights and its dignity. This will also ease the process to bring the global culprits into the legal custody without differentiation of any boundary. John Hoffman has rightly argued that, "each

layer, if it is democratically constructed, strengthens the other. Global citizenship ...does not operate in contradiction with regional, national and local identities. It expresses through them” (Hoffman, 2004) Based on the above impulses, it can be rightly argued that, global citizenship in harmony with criterion of national citizenship, having egalitarian structure ensuring peace and development for all as its inalienable human right is the pragmatic and feasible need of the hour, which leads to the way of better world order. Global consciousness is creating a transnational identity, which is forming the basis for global citizenship.

अयं बन्धुरयनेति गणना लघुचेतसाम् ।
उदारचरितानां तु वसुधैव कुटुम्बकम् ॥

(महोपनिषद् चतुर्थ अध्याय, ७१वां श्लोक)

The distinction of mine and theirs is the work of ignorant narrow-minded people who lives in duality but for the truth-seekers, having noble conduct, the whole globe is one family united in one strand. Let the world move towards truth, towards unity and towards global citizenship with the philosophy of *vasudhaiv kutumbkam*. Maharishi Aurobindo illustrates it as, the truth or higher consciousness - the Mother's - in which one sees all the world as one, a vast free consciousness full of freedom peace and light - it is that we speak of as the higher or divine consciousness (Glosaary of Terms in Sri Aurobindo's Writings, 1979).

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Comparative Study of Useful Heat Values derived from the Proximate Analysis of Bituminous Coals from Barakar Formation of Various Gondwana Basins of India

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Abstract — The Gondwana coal deposits account for more than 98% of the Indian coal reserves. The geochemical characterization of these coals is important for determination of their use in various industries. In the present study, we have conducted proximate analysis on bituminous coals collected from four mines namely Lalmatia Coal Mine, Rajrappa Coal Mine, Mohan Colliery and Dhanpuri Coal Mine in the different Gondwana Basins, belonging to the Barakar Formation. The moisture and volatile matter content of these coals show comparable values, but the ash content and fixed carbon content show a significant variation in these coals. The useful heat values calculated by using these proximate constituents show that the coals of Mohan Colliery have the lowest useful heat values (1307.24 kCal/kg), while the coals of Lalmatia Coal Mine have the highest useful heat values (5587.47 kCal/kg) with , even though all these coals belong to the same geological horizon.

Keywords: *Bituminous coals, Gondwana Basins, Proximate Analysis, Useful Heat Values*

Introduction

The sedimentary sequences deposited in the Gondwana basins account for over 98% of the total coal deposits of India. The Gondwana basins, which are believed to represent an originally extensive and thicker master basin (Vaidyanadhan and Ramakrishnan, 2010), were formed after the rivers brought sediments to fill the elongate depressions which formed due to the reactivation of shear zones, faults and rift valleys of the Precambrian times (Valdiya, 2010). These sequences occur across several basins, namely the Rajmahal, Son-Mahanadi, Satpura, Rewa, Godavari, Rajmahal basins. The Gondwana deposits, ranging in age from Permian to early Cretaceous, have witnessed varied climate, ranging from cold temperate (King, 1958) with alternating dry and wet seasons (Kräusel, 1961) to warm and even warm temperate (King, 1961). The variation in the climate led to luxuriant growth of flora, which ranged from stunted, broad-leaved representing *Glossopteris* and *Gangamopteris* to trees like *Lepidodendrons* and *Sigillaria*, which attained the height of upto 30 m (Stach et al., 1982). The majority of Gondwana coals are bituminous with carbon content varying between 60 to 80 per cent.

The Gondwana coals have been extensively studied for their petrographical and geochemical characterization since late nineteenth and early twentieth centuries. The coal in the Rajmahal Basin was reported in 1829 by Twiner, while the systematic studies started after establishment of Geological

Survey of India in 1851 (Singh and Singh, 1996). The coals of Mahanadi Valley were systematically surveyed by Blanford et al. (1856). The Damodar Valley holds the distinction for being the first coal mine in India where mining started in 1774 (Chandra et al., 2000). The first occurrence of coal in the Satpura Basin was reported by Quseley (1835) and extensive survey was conducted by Medlicott (1871, 1875, 1879) and Jones (1887). With time, the research has advanced to higher levels of elemental analysis.

In the present work, we have focused on the geochemical characterization of the bituminous coals by conducting the proximate analysis and comparing the results from four locations, namely Lalmatia opencast mine, Jassidih (Jharkhand) in the Rajmahal Basin, Rajrappa opencast mine, Ramgarh (Jharkhand) in the Damodar Valley, Mohan Colliery, Chhindwara (Madhya Pradesh) in the Satpura Basin and the Dhanpuri opencast mine, Shahdol in the Rewa Basin.

Geology of the Study Areas

The study areas are located in the different Gondwana Basins (figure 1). The geology of each area is discussed below:

1. Lalmatia Opencast Mine, Jassidih District (Jharkhand)

Along the western edge of the Rajmahal Hills, a narrow strip of Lower Gondwana rocks is exposed, which is referred to as Rajmahal coalfield. Belonging to the coal bearing Barakar Formation, the entire coalfield is a small part of the Rajmahal Basin. Rajmahal Basin constitutes a minor part of the Gondwana basin and comprises of Talchir, Barakar and Dubrajpur formations, overlain by the Rajmahalvolcanics (Singh and Singh, 1996; Vaidyanadhan and Ramakrishnan, 2010). The Lalmatia Opencast mine is situated in the Hura Coalfield, which is one of the five coalfields in this region. The Barakar Formation exposed here is divided into lower and upper parts, with the later having greater thickness (Singh and Singh, 1996). The Lower Barakar Formation, devoid of coal seams, consists mainly of arkosic sandstones, while, the Upper Barakar Formation is characterized by interbedded sequences of coal, coaly shales, carbonaceous shales, claystone and sandstones (Metchem, 1987). Samples were collected from the seam-III of the Upper Barakar in the Lalmatia opencast mine.

2. Rajrappa Opencast Mine, Ramgarh District (Jharkhand)

The Rajrappa opencast mines are a part of the Ramgarh coalfield located in the Damodar Valley Basin, which is surrounded by Bokaro-Hazaribagh Plateau and Rachi Plateau of Archean age (Mahadevan, 2002). The study area comprises of Archean basement, unconformably overlain by Talchir and Barakar formations of early Permian age (Mahadevan, 2002). The main lithounit of coal bearing strata is Barakar Formation, which occupies major part of coal bearing sediments and has a thick of approximately 600 m (GSI, 1963). The sampling was done from the seam-VII of the Barakar Formation in the Rajrappa opencast mine.

3. Mohan Colliery, Chhindwara District (Madhya Pradesh)

This area is located in the Satpura Basin, which has rocks of Lower Gondwana exposed in a syncline (Singh and Shukla, 2004), while Upper Gondwana on the edge of syncline (Raja Rao, 1983). The unexposed Archean basement is unconformably overlain by Talchir, Barakar and Motur formations of Late Carboniferous to Jurassic age, which is unconformably overlain by Deccan Flood Basalts of Late Cretaceous (Samaddar and Banerjee, 1978). The Barakar Formation is the only coal bearing unit (Singh and Shukla, 2004), estimated to be >450 m thick, consisting of sandstones interbedded with

carbonaceous shales and coal seams. A typical cyclic deposition of sandstone, shale and coal was seen along a road cut section in Junnardeo in this region. Sampling was done from the seam-III of the Barakar sandstone in the Mohan Colliery.

4. Dhanpuri Opencast Mine, Shahdol District (Madhya Pradesh)

Dhanpuri opencast mine, located within the Burhar-Amlai sub-basin (Agnihotri et al., 2018), comes under the Sohagpur coalfield in the Shahdol district, which is the second highest producing coalfield in Madhya Pradesh (Coal Directory of India, 2014-15). Sohagpur coalfield has Precambrian basement, unconformably overlain by Talchir and Barakar Formations (early Permian age), Pali Formation (middle Permian-middle Triassic age), Parsora Formation (early Jurassic) and Lameta Beds (late Cretaceous age) (Raja Rao, 1983). The sampling was done from the seam-VI, which is the only workable seam in the Dhanpuri opencast mine.

The Talchir and Barakar formations of Early Permian age, unconformably overlying the Precambrian basement, are exposed in all the four study areas. The Barakar Formation is the main lithounit where the coal bearing strata provide the thickest and workable coal seams.

Materials and Methodology

Ten composite coal samples from a workable each coal mine were collected from a workable seam using the pillar sampling method. The whole samples were first subjected to megascopic study for the identification of bright and dull components and were further classified using the Diessel's Scheme of classification (1965).

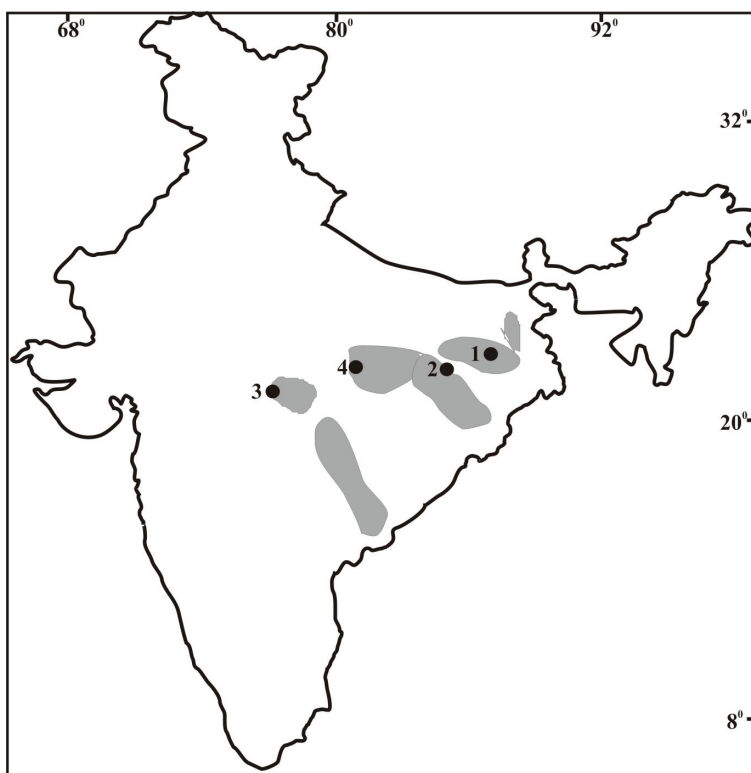


Figure 1: The location of the study sites: 1. Lalmatia Opencast mine, 2. Rajrappa Opencast mine, 3. Mohan Colliery and 4. Dhanpuri Opencast mine. The shaded portions mark the coalfields located in the Gondwana basins (modified after Vaidynadhan and Ramakrishnan, 2010).

The analytical technique applied for geochemical characterization was Proximate Analysis. In this technique, the coals samples were crushed to a preferable size of 70 mesh and the powder was subjected to oven and muffle furnace as per BIS (2003). This technique was used to determine the moisture content, volatile matter content, ash content and fixed carbon content of the coals. The results for proximate analysis are discussed for air dried and dry ash free basis.

Table 1 presents a generalized classification and correlation of strata exposed in the four study areas.

Moisture Content

One gram of air-dried coal powder of 70 mesh size was weighed and spread uniformly over a petri dish. The dish was then heated in an oven at a temperature of 108⁰C for 90 minutes. The dish was then removed from the oven and cooled in a desiccator for nearly 30 minutes. The residue was then weighed to calculate the weight lost as a result of heating. The moisture content in the coal was calculated as weight per cent.

$$\text{Moisture wt.}\% = \frac{(\text{wt. of coal powder} - \text{wt. of residue after heating})}{(\text{wt. of coal powder})} \times 100$$

(Chandra et al, 2000)

Volatile Matter (VM)

The VM comprises of all the volatile components, excluding the moisture, released during the heating of coal (Speight, 2005). The VM not only comprises of volatiles present in organic matter, but also volatiles from the mineral matter, e.g. carbon dioxide, hydrogen chloride, and sulphur from carbonate, chloride and pyrite minerals respectively. To find the VM content, one gram of air-dried coal powder of 70 mesh size was weighed and placed in a silica crucible and covered with a lid. The crucible was then placed in Muffle Furnace, with temperature allowed to rise to 900⁰C. The crucible was then heated at this temperature for 7 minutes. After heating, the crucible was placed in a desiccator for cooling. The residue was then weighed to note the loss in weight. The VM is represented as weight per cent.

$$\text{VM wt.}\% = \frac{(\text{wt. of coal powder} - \text{wt. of residue after heating})}{(\text{wt. of coal powder})} \times 100 - \text{Moisture wt.}\%$$

(Chandra et al, 2000)

Ash Content

Ash is defined as the residue remaining after the combustion of coal under specified conditions and is composed primarily of oxides and sulphates (Speight, 2005). It forms as a result of chemical changes taking place in mineral matter during ashing, some of which are loss of water from silicate minerals, loss of carbon dioxide from carbonate minerals, oxidation of pyrite to iron, fixation of oxides of sulphur by bases such as calcium and magnesium.

To find the ash content, one gram of air-dried coal powder of 70 mesh size was weighed and placed in a silica crucible and left uncovered initially at room temperature inside a Muffle Furnace. The temperature was then raised to 500⁰C in 30 minutes and then gradually to 815⁰C in the next 30-60 minutes. This temperature was then maintained for next 60 minutes. Afterwards the crucible was placed in a desiccator and the residue was then weighed to know the loss in weight. Ash content is represented as weight per cent.

$$\text{Ash wt.\%} = \frac{(\text{wt. of residue after heating})}{(\text{wt. of coal powder})} \times 100 \quad (\text{Chandra et al, 2000})$$

Fixed Carbon (FC)

The FC is defined as the solid combustible residue remaining after expulsion of VM (Speight, 2005). It can be calculated in weight per cent as

$$\text{FC wt.\%} = 100 - (\text{Moisture wt.\%} + \text{VM wt.\%} + \text{Ash wt.\%}) \quad (\text{Chandra et al, 2000})$$

The dry ash free (d.a.f.) basis values of VM can be calculated as

$$\text{VM wt.\%}_{(\text{d.a.f.})} = \frac{\text{VM (air dried)} \times 100}{100 - (\text{Moisture} + \text{Ash})} \quad (\text{Chandra et al, 2000})$$

The weight per cent of ash and moisture were then used to calculate the useful heat value (UHV) of the coal using the empirical formula

$$\text{UHV} = 8900 - 138 \times (\text{wt.\% of Ash} + \text{wt.\% of Moisture}) \quad (\text{Ghosh et al., 2016})$$

Results and Discussion

The values of the proximate constituents were analyzed for all the samples recovered from the seam to find the variation of these constituents along the seam, i.e. from bottom to top of a seam. Further, the mean value was calculated (fig. 2).

In the coals of Lalmatia opencast mine, the moisture content ranges from 7.19 to 9.92%, VM from 23.35 to 43.07%, ash from 13.01 to 30.09% and FC from 27.94 to 53.73% on air dried basis. The VM and FC on d.a.f. basis range from 49.90 to 69.76% and 30.24 to 50.1% respectively.

In the coals of Rajrappa opencast mine, the moisture content ranges from 4.01 to 7.71%, VM from 38.96% to 54.07%, ash from 10.77 to 16.93% and FC from 23.44 to 39.79% on air dried basis. The VM and FC on d.a.f. basis range from 31.18 to 50.80% and 8.76 to 43.85% respectively.

In the coals of Mohan colliery, the moisture content ranges from 1.68 to 7.30%, VM from 25.43 to 44.4754.07%, ash from 37.35 to 67.79% and FC from 5.38 to 13.43% on air dried basis. The VM and FC on d.a.f. basis range from 71.57 to 87.76% and 12.23 to 28.425% respectively.

The average values of the results of proximate analysis are presented in table 2.

Table 1: Generalized classification and correlation of strata exposed in the study areas of various Gondwana Basins.

Age	Lalmatia Opencast Mine, Hura Coalfield, Rajmahal Basin (Metchem, 1987)	Rajrappa Opencast Mine, Ramgarh Coalfield, Damodar Valley (Vaidhynadhan and Ramakrishnan, 2010)	Mohan Colliery, Chhindwara, Satpura Basin (Samaddar and Banerjee, 1978; Vaidhynadhan and Ramakrishnan, 2010)	Dhanpuri Opencast Mine, Sohagpur Coalfield, Rewa Basin (Agnihotri et al., 2018)
Recent	Alluvium	Alluvium	Alluvium	Alluvium

Age	Lalmatia Opencast Mine, Hura Coalfield, Rajmahal Basin (Metchem, 1987)	Rajrappa Opencast Mine, Ramgarh Coalfield, Damodar Valley (Vaidhynadhan and Ramakrishnan, 2010)	Mohan Colliery, Chhindwara, Satpura Basin (Samaddar and Banerjee, 1978; Vaidhynadhan and Ramakrishnan, 2010)	Dhanpuri Opencast Mine, Sohagpur Coalfield, Rewa Basin (Agnihotri et al., 2018)
Pleistocene	-Unconformity-		Dolerite Intrusives	
			-Unconformity-	
Late Cretaceous			Deccan Flood Basalts	Deccan Traps
				Lameta Beds
Early Cretaceous				
Late Jurassic				-Unconformity-
Middle Jurassic	Rajmahal Traps			
Early Jurassic		Mahadeva Formation (Supra Panchet Formation)	-Unconformity-	Parsora Formation
Late Triassic	Dubrajpur Formation			-Unconformity-
Middle Triassic	-Unconformity-			
Early Triassic		Panchet Formation		
Late Permian		Raniganj Formation	Motur Formation	Pali Formation
Middle Permian		Barren Measures	-Unconformity-	
Early Permian	Barakar Formation	Barakar Formation	Barakar Formation	Barakar Formation
	Karharbari Formation	Talchir Formation	Talchir Formation	Talchir Formation
	Talchir Formation			
	-Unconformity-	-Unconformity-	-Unconformity-	-Unconformity-
Proterozoic		Basement	Metamorphics and intrusives	Basement
Archean	Basement		Basement (not exposed)	

Table 2: Composite result of proximate analysis of 10 coal samples from each seam.

Proximate Constituents	Lalmatia Opencast Mine Mean wt.%	Rajrappa Opencast Mine Mean wt.%	Mohan Colliery Mean wt.%	Dhanpuri Opencast Mine Mean wt.%
<i>Air-dried basis</i>				
Moisture	8.24	5.30	4.77	8.80
Volatile Matter	44.21	29.38	36.15	26.69
Ash	13.59	20.06	50.25	24.85
Fixed Carbon	33.24	45.24	10.08	39.67
<i>Dry Ash Free basis</i>				
Volatile Matter	56.69	39.36	78.02	40.36
Fixed Carbon	43.38	35.28	21.98	25.99

The mean values were then used to calculate the Useful Heat Values (UHV) of coals of each area (table 3).

Table 3: Useful heat value for coals from study area

	Useful Heat Value (kCal/kg)
Lalmatia Opencast Mine	5887.46
Rajrappa Opencast Mine	5400.32
Mohan Colliery	1307.24
Dhanpuri Opencast Mine	4256.3

The coals used in this study are bituminous coals, which account for moisture content less than 10%. The VM content helps in judging the behaviour of coal on combustion, carbonization and gasification (Chandra et al., 2000). The values of VM suggest that the coals of Rajrappa and Dhanpuri opencast mines are of coking quality, while the Lalmatiaopencast mine and Mohan Colliery are of non-coking variety. The ash content of coal is the result of complete combustion of inorganic mineral matter of the coal and amounts to roughly 10% less than the original mineral matter (Chandra et al., 2000). The mineral matter is of two types- *i.* inherent mineral matter, incorporated in the coal during the early stage of coal formation, *ii.* epigenetic mineral matter, which is deposited subsequent to the formation of coal in its cracks, fissures, cleavages or cleats through percolating water (Chandra et al., 2000). The ash content of the coals from Mohan Colliery is highest among the four study areas. This provides the evidence for high epigenetic mineral matter in the Mohan Colliery coals. Thus, the FC content of the three study areas, viz. Lalmatia, Rajrappa and Dhanpuri opencast mines show comparable values, while the Mohan Colliery shows the lowest value.

Conclusion

Based on a comparative study of coal samples from the Barakar Formation exposed in various mines of four Gondwana basins, we deduce that the high rank coals are to a large extent affected by the local sedimentation, groundwater and tectonic conditions, which may cause a variation in their proximate constituent contents as well as useful heat values, even though they may be derived from same geological horizon. Out of the four study areas, the Mohan Colliery coals have the highest ash content (50.25%) and lowest UHV (1307.24 kCal/kg), which makes them commercially least viable. The Lalmatia Opencast mine coals show highest UHV of 5587.47 kCal/kg and lowest ash content of 13.59%. This presents a direct relationship between the ash content and UHV. These values shall help to assess the behaviour of coal on combustion, gasification and carbonization.

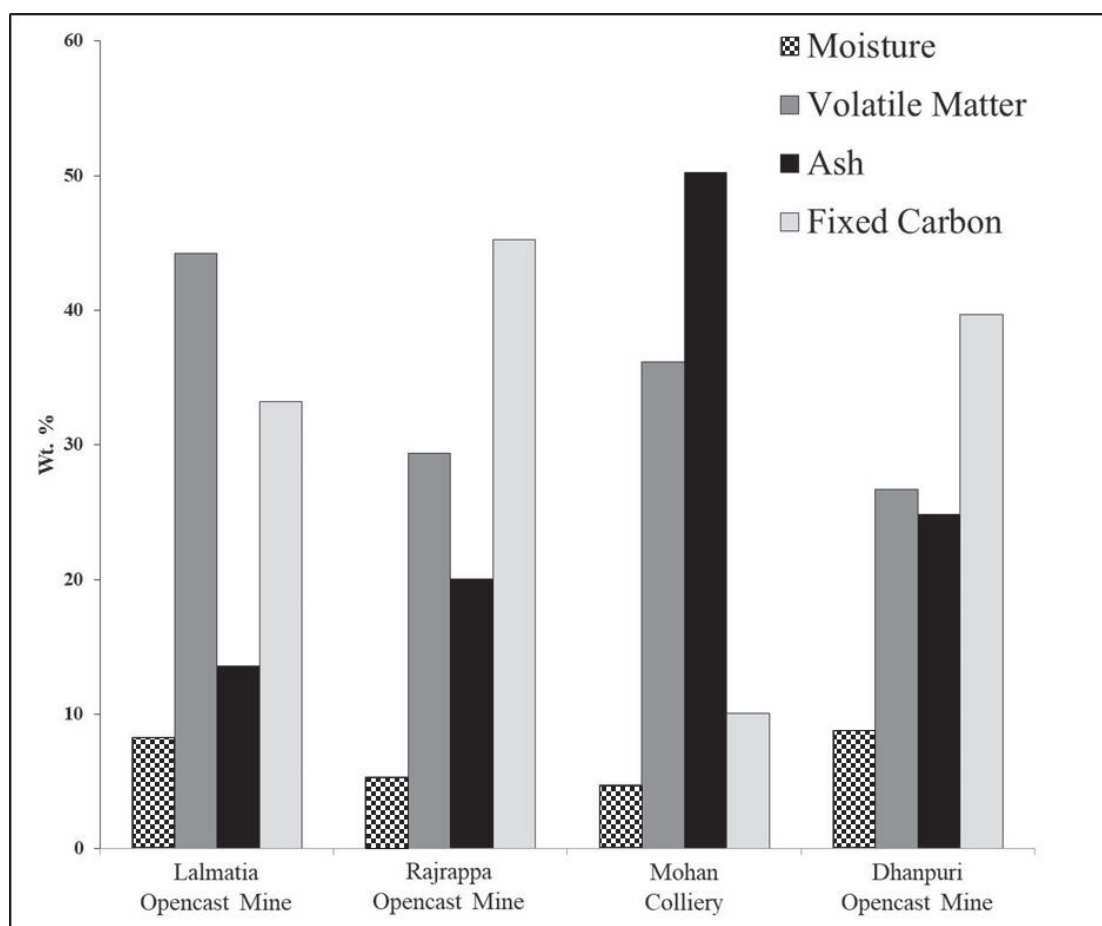


Figure 2: Proximate analysis of coal from the study areas.

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Dhanpuri coal samples, Officials of Rajrappa Opencas Mines, Ramgarh (Jharkhand) and SECL, Sohagpur and Dhanpuri Opencast Mine for permitting the fieldwork and collection of coal samples. VPS also gratefully acknowledges the efforts of his students Angana Chaudhuri, Eram Shaikh, Rajvardhan Sharma and Prakash Tiwari during the fieldwork and lab studies.

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The Contours of Modi's Foreign Policy in the Contemporary Global World

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Abstract — The article will be critically analyzing the major contours of Modi's foreign policy in the contemporary global world. The nature of Indian foreign policy has been shifted from non - alignment to multi - alignment. India has given importance to the concept of strategic autonomy while establishing bilateral relations with the global countries. India has been playing a predominant role in the various regional and global organizations and institutions. India also strongly believes in the concept of multipolarity. India has been playing a vital role in the multi-polar organizations i.e. Brazil, Russia, India, China, South Africa(BRICS), Association of Southeast Asian Nations (ASEAN), Shanghai Cooperation Organization(SCO), The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), South Asian Association of Regional Cooperation(SAARC), Quad Group - US, Australia, Japan, and India; European Union (EU). India has been developing a strategic partnership with the major powers in the contemporary global world. In this context, this article will be analyzing Modi's foreign policy in the contemporary world order.

Keywords: *Modi's Doctrine of Indian Foreign Policy, Multilateralism, Act East Policy, Strategic Partnership, Maritime Security.*

The Major Trends of Indian Foreign Policy

Contemporary Indian foreign policy has been extensively focusing on soft nationalism; developing close ties with the Asian countries, designing the market-oriented economy to develop strategic partnerships (Kukreja 2020, Chellaney, 2014). Modi's foreign policy has encouraged new Asianism, soft nationalism, and market-oriented economy to play a vital role in the contemporary global world (Chellaney, 2014, Kukreja 2020). Modi has introduced dynamic changes in the Indian foreign policy during his able leadership. Prime Minister Shri Narendra Modi has developed a strategic partnership with the major powers in the contemporary global world (Kukreja 2020, Gupta, 2019; Mullen, 2019).

Dynamic changes have taken place in the strategic orientation of Indian foreign policy towards the world order under the dynamic leadership of Shri Narendra Modiji (Kukreja 2020). Modi had invited foreign investments from the global countries and also actively engaged with the rest of the world. Further, he has strengthened bilateral relations with the South Asian countries and strongly advocated for regional integration. India is also developing good relations with the USA and its strategic patterns i.e. Australia, Japan. India has given high-level importance to strategic autonomy

while developing relations with the global world. Global countries including USA, Russia, and France have been strongly advocating the case of India for permanent membership in the Security Council of the United Nations. India would like to play a vital role at the regional level and also at the global level. India has designed a dynamic foreign policy to deal with Pakistan and China in the neighborhood. Pakistan's support for China's OBOR Project and violence in Jammu and Kashmir has serious implications for Indian security and sovereignty. The present government is effectively dealing with cross border terrorism in international borders. India is playing a vital role in the South Asian region due to its military power, naval power, and high economic growth (Kukreja 2020, Sridharan, 2017).

Domestic Priorities of Foreign Policy

The following factors will explain the agenda of Modi's Foreign policy:

(i) Developing India's bilateral relations within the East Asian States to further economic development (ii) Redesigning Indian foreign policy towards Pakistan and China (iii) developing a strategic partnership with major superpowers and neighboring countries in South Asia (BJP Manifesto 2014, Ian Hall 2015). Modi has given priority to the economy while developing good relations with the USA, Australia to attract foreign direct investment and propagating schemes like Make in India, Skill India, and Digital India to promote indigenous manufacturing and investment from rich Indian Diaspora. East Asian states have invested in infrastructure and also to build factories with the sum of US\$ 35 billion (Shankar 2014). Modi has invited all South Asian States for his oath-taking ceremony at New Delhi. Further, Narendra Modi has declared to develop a strategic partnership with the leaders of South Asia. Narendra Modiji would like to integrate the least integrated region in the South Asian region. Modi has played a vital role to strengthen the South Asian Association for Regional Cooperation (SAARC).

Soft Power Foreign Policy

Previously, UPA and NDA administrations have also extensively developed the soft power foreign policy. During the Vajpayee's regime, international tourists were attracted and invited under the scheme of 'Incredible India' programme in the year 2002. Ministry of Overseas Indian Affairs has invited non – residents Indian (NRIs) in the year 2014 to invest in the Indian infrastructure projects. In the year, 2006, Public Diplomacy Division has been established by the UPA -1 Congress-led Government and it has made significant efforts to further Indian foreign policy in the contemporary multipolar world order (Ian Hall 2015).

Modi's Doctrine of Indian Foreign Policy

Hon'ble Prime Minister of India Shri Narendra Modi has brought out dynamic changes in the Indian Foreign policy. The principles and objectives of Narendra Modi's foreign policy had been described as '*Modi's doctrine of Indian Foreign Policy*'. The following aspects are part of Modi's doctrine of Indian foreign policy : (i) developing economic relations with the global world (ii) furthering multilateralism by effectively participating in the various multilateral and regional organizations (iii) developing strategic defence cooperation with the Russia, USA, Francine, EU, Australia and Israel (iv) Promoting India's 'soft power foreign policy ' (Ian Hall 2015). Indian Prime Minister Shri Narendra Modi has many opportunities to bring dynamic and structural changes in the contemporary global world (Ian Hall, 2016, Griffith University, Brisbane, Australia; Raja Mohan 2020).

Subramanyam Jaishankar, Minister of External Affairs on Indian Foreign Policy

External Affairs Minister Shri Subramanyam Jaishankar has delivered a lecture at International Institute for Strategic Studies on 20 June 2015. During his lecture, Jaishankar has stated that India is strongly committed for multi alignment, to realize the objectives of ‘multipolar world’. Further, he has declared that India would like to develop bilateral relationships with all major powers in the contemporary global world (Jaishankar, 2015). Further, Jaishankar has explained that India would like to develop defence cooperation, strategic partnership human capital and FDI by actively engaging with the USA, Russia, France, China and EU (Jaishankar 2015, Ian Hall 2016).

Modi’s Vision of Indian Foreign Policy

Hon’ble Prime Minister, Shri Narendra Modi Ji has five aims: (i) achieving a prominent place in India’s neighborhood (ii) developing economic relations and strategic partnership with USA, Russia, Japan, Australia and France (iii) developing diplomatic relations with China to resolve the issues (iv) furthering India’s national interests (v) to actively engage with Indian Diaspora to further Indian national interest in the global world (Satish Chandra 2014, Barsur 2015, Ian Hall 2015).

Principles of Foreign Policy of Shri Narendra Modi Ji

Indian Prime Minister Shri Narendra Modiji has followed the following principles of Indian Foreign Policy: (i) Establishing strategic partnership with Russia, USA, France, UK to develop defence cooperation (ii) Playing a vital role in the multipolar and regional organizations (iii) Developing an effective strategy to combat traditional & non – traditional security threats; (iv) (v) Developing dynamic foreign policy towards neighborhood countries in the South Asia region (vi) furthering Indian economy by establishing economic, commerce and trade relations with the global countries (Ian Hall 2016, Barsur 2016).

Major Shift in Indian Foreign Policy

Modi’s Doctrine of Indian foreign policy has brought our major changes in the nature of Indian foreign policy. The foreign policy of Modi has extensively focused on the following aspects :(i) active engagement with the major powers by replacing the strategies of the Cold War (ii)– promoting and developing Indian tradition of Vasudhaiva kutumbakam by extensively focusing on the principles of democracy and democratization. Hon’ble Prime Minister Shri Narendra Modi Ji has strongly advocated above-mentioned principles in his foreign policy (Barsur 2015, Ian Hall 2016).

Multialignment

Modi’s foreign policy has extensively focused on multi alignment. India has adopted the concept of strategic autonomy. The concept of non - alignment had gained momentum in international relations during the cold war period. The contemporary global situation has enabled India to adopt the concept of multi alignment’ strategy to establish good relations and network with regional and international institutions. The Indian foreign policymakers have also implemented the above principles in letter and spirit to further the objectives of Indian foreign policy (Legro, 2012, Jaffrelot, 2014; Hall, 2015a; Mohan, 2015).

Elements of Multialignment

The following principles of multi alignment have brought out major changes in the Indian foreign policy: (i) playing a vital role in the various multilateral organizations i.e. Brazil, Russia, India, China, South Africa(BRICS); QUAD group(India, USA, Japan and Australia); South Asian Association of Regional Cooperation(SCO); Association of Southeast Asian Nations(ASEAN); Eastern Forum; European Union(EU); Shanghai Cooperation Organization(SCO); African Union(AU); Russia – India - China Trilateral Cooperation (RIC), Organization of Petroleum and Exporting Countries(OPEC), Gulf Council, (ii) developing strategic partnership with defence cooperation with major powers in the global world i.e. USA, Russia, France (Ian Hall 2015). (iii) developing maritime strategic cooperation in the Indo- pacific region (iv) furthering diplomatic and bilateral relations with the neighborhood in South Asia (v) playing a vital role in the Eurasian region (vi) developing defence cooperation with Russia to further military, technical cooperation (vii) implementing the objectives principles of 2+2 Agreement signed by both India and USA (viii) developing effective foreign policy strategy towards West Asia (ix)implementing the principles of Act East Policy very effectively to develop better economic relations with the East Asian countries (x) promoting India’s soft power foreign policy through yoga, Indian traditions, Buddhism in the neighborhood and the global world (xi) developing better diplomatic relations with China to resolve the border conflicts at LAC/LOC (xii)developing a strong mechanism to resolve the cross border terrorism issues with special reference to Pakistan.

Strategic Autonomy & Multialignment

Multialignment has been designed not to maintain equidistance unlike non - alignment between the major powers. Rather it is a great strategy to avoid military, economic, and political dependence on major powers. It indicates that India has a strong commitment to strategic autonomy. India has been playing a vital role in the contemporary global world. It will also convince the various groups who think about foreign policy i.e. those who think of developing good relations with the USA and the pro-China lobby; those are concerned about the rise of China and also between those who want to continue a strategic partnership with Russia (Ian Hall 2015).

Modi’s Doctrine of Indian Foreign Policy

Following key elements are part of the Modi’s doctrine of Indian foreign policy: (i) developing India as a confident, self-reliant and strong nation to further national interests for holistic development(ii) India would like to develop a strategic partnership with the neighborhood countries (iii)promotion of soft power foreign policy through India’s traditions, values, technology and tourism (iv) promoting multi-track alignment policy with major powers (v) addressing various contemporary global issues at multilateral forums (Ian Hall 2015, Barsur 2015).

The transition of Indian Foreign Policy from Non –Alignment to Multi – Alignment

Multialignment has three important concepts related to foreign policy: (i) establishing good relations with various multilateral forums and institutions (ii) developing a strategic partnership with major powers and neighborhood countries. Foreign policy has been designed to achieve the following aspects: (i) furthering India’s economic growth by actively engaging with major powers (ii) strengthening India’s national security to deal with the internal and external security threats (iii) playing a pivotal role in the multipolar world order (v) finally, propagating and implementing India’s social and political values in the global world (Barsur 2017, Ian Hall 2015).

Five Pillars of Modi's Foreign Policy

Since we are living in an interdependent world, India strongly believes in the concept of Vasudhaiva Kutumbakam i.e. the world is one family. India promotes the global humanitarian values of harmony and peace in the contemporary global world. In April 2015, Hon'ble Prime Minister Shri Narendra Modi Ji has explained the five pillars of Indian foreign policy from the concept of Panchamrit (five sacred foods) in April 2015. The five pillars of his foreign policy are (i) engagement, dialogue (samvād) (ii) cultural and civilizational linkages (Sanskriti evam sabhyat) (iii) global and regional security (Suraksha) (iv) dignity, honor (Samman) (v) shared prosperity (samridhhi) (Basrur 2017, Ian Hall 2019, Blarel 2019, MS Pardesi 2019, Ganguly 2019).

India's Neighborhood Policy During 2014– 2019

The strategic, economic and political landscape in the neighborhood countries has been changed significantly. Dynamic changes are taking place in the Indo- Pacific region. Geoeconomic shifts and geopolitical shifts/changes have created opportunities and challenges for India. The dynamic leadership of Narendra Modi and his domestic political position has enabled him to develop innovative foreign policy. Modi has brought out remarkable changes in the nature and dynamics of Indian foreign policy (Ganguly, 2017, Kaura 2020, Meena 2020).

India would like to develop a strategic partnership with major powers as well as dynamic neighborhood foreign policy towards South Asian region. Indian diplomacy has given priority to the bilateral relations with the South Asian neighbors. The approach of Modi government's diplomatic approach towards South Asian countries is '*Neighbors first*'. Given the geopolitical situation, India has to resolve the differences with its neighbors to have cordial relations with the neighboring countries (Kaura 2020, Meena 2020).

Indian Prime Minister Shri Narendra Modi would like to develop a strategic partnership with the neighborhood countries. Modi being a decisive and innovative leader developed dynamism in the Indian foreign policy. C. Raja Mohan has analyzed the evolution of Indian foreign policy with special reference to the Republic. According to his analysis, 'First Republic' indicates from the initial independence time to the advent of the liberalization era and the 'Second Republic' indicates post-cold war period; whereas the 'Third Republic' has witnessed the multi alignment and furthering India's image in the global world (Raja Mohan 2015, Kaura 2020, Meena 2020).

Renowned Indian foreign scholar Sumit Ganguly has pointed out that India has faced some challenges while developing new dynamism and bilateral relations with South Asian states. The concept of strategic autonomy is attained much prominence and significance in the Indian foreign policy during Prime Minister Modi's regime (Ganguly 2018, Kaura 2020, Meena 2020).

Prime Minister Shri Narendra Modi has reiterated the significance of Russia in the contemporary global world order. India – Russia strategic partnership has been elevated from a strategic partnership to special privileged strategic partnership. Further, he has also highlighted the significance of strategic autonomy in the contemporary global world (Ministry of External Affairs, Government of India, 2018). Hon'ble Prime Minister of India - Shri Narendra Modi has visited the following countries from 2014 to 2019.

Table 1: Visits of Prime Minister of India to various countries since 2014

S. No.	Place of Visit	Period of Visit
1	Bhutan	15 June – 16 June 2014
2	Brazil	13 July – 17 July 2014
3	Nepal	3 Aug – 5 Aug 2014
4	Japan	30 Aug – 3 Sept 2014
5	USA	25 Sept – 1 Oct 2014
6	Myanmar, Australia & Fiji	11 Nov – 20 Nov, 2014
7	Nepal	25 Nov – 27 Nov, 2014
8	Seychelles, Mauritius & Sri Lanka	10 March – 14 March 2015
9	Singapore	28 March – 29 March 2015
10	France, Germany & Canada	9 April – 17 April 2015
11	China, Mongolia & South Korea	14 April – 19 May 2015
12	Bangladesh	6 June – 7 June 2015
13	Uzbekistan, Kazakhstan, Russia, Turkmenistan, Kyrgyzstan & Tajikistan	6 July – 14 July 2015
14	United Arab Emirates	16 Aug – 17 Aug 2015
15	Ireland and the USA	23 Sept – 29 Sept 2015
16	UK and Turkey	12 Nov – 16 Nov, 2015
17	Malaysia and Singapore	20 Nov – 24 Nov, 2015
18	France	29 Nov – 30 Nov, 2015
19	Russia, Afghanistan & Pakistan	23 Dec – 25 Dec 2015
20	Belgium, USA and Saudi Arabia	30 Mar – 03 Apr 2016
21	Iran	22 May – 23 May 2016
22	Afghanistan, Qatar, Switzerland, the USA and Mexico	4 June – 9 June 2016
23	Uzbekistan	23 June – 24 June 2016
24	Mozambique, South Africa, Tanzania and Kenya	7 July – 11 July 2016
25	Vietnam and China	2 Sept – 5 Sept 2016
26	Laos	7 Sept – 8 Sept 2016
27	Japan	10 Nov-12 Nov, 2016
28	Sri Lanka	11 May-12 May 2017
29	Germany, Spain, Russia & France	29 May-3 June 2017
30	Kazakhstan	8 June-9 June 2017
31	Portugal, USA and Netherlands	24 June-27 June 2017
32	Israel and Germany	4 July-8 July 2017
33	China and Myanmar	3 Sept-7 Sept 2017
34	Philippines	12 Nov-14 Nov, 2017
35	Switzerland	22 Jan-23 Jan 2018

S. No.	Place of Visit	Period of Visit
36	Jordan, Palestine, UAE & Oman	09 Feb-12 Feb,2018
37	Sweden, UK & Germany	16 April-20 April 2018
38	China	26 April-28 April 2018
39	Nepal	11 May-12 May 2018
40	Russia	21 May-22 May 2018
41	Indonesia, Malaysia & Singapore	29 May-2 June 2018
42	China	09 June-10 June 2018
43	Rwanda, Uganda & South Africa	23 July-28 July 2018
44	Nepal	30 Aug – 31 Aug 2018
45	Japan	27 Oct – 30 Oct 2018
46	Singapore	13 Nov – 15 Nov, 2018
47	Maldives	17 Nov – 17 Nov, 2018
48	Argentina	28 Nov – 3 Dec 2018
49	South Korea	21 Feb – 22 Feb 2019
50	Maldives & Sri Lanka	08 June – 09 June 2019
51	Kyrgyzstan	13 June – 14 June 2019
52	Japan	27 June – 29 June 2019
53	Bhutan	17 August – 18 August 2019
54	France, UAE and Bahrain	22 August – 27 August 2019
55	Russia	04 September – 05 September 2019
56	USA	21 September – 28 September 2019
57	Saudi Arabia	28 October – 29 October 2019
58	Thailand	02 November- 04 November 2019
59	Brazil	13 November- 15 November 2019

Source: PM INDIA Web Portal, <https://www.pmindia.gov.in/en/details-of-foreigndomestic-visits/>, Accessed on September 20, 2020.

The above table clearly illustrates that India has purchased the following major weapons/ arms from Russia: Anti-tank missile, Naval MRL, Air search radar, Anti-ship MI/SSM, SSM, FGA aircraft ASW MRL, ASW MRL, Self-propelled MRL, IFV, Tank, Self-propelled MRL, FGA aircraft, Diesel engine, ASM, Anti-tank missile, Tank, IFV, Light helicopter, Frigate, Anti-tank missile, Portable SAM, Tank, Naval gun, Air search radar, Anti-ship missile, Air search radar, ARM, Combat ac radar, SRAAM, Anti-ship missile/ARM, Frigate, Anti-ship MI/SSM, Guided Bomb, FGA aircraft, Air search radar, Fire control radar, ASW MRL, Anti-tank missile, Turbofan, ASW aircraft, AEW helicopter, Anti-ship missile, Tank, Diesel engine, Naval gun, Naval gun, Anti-tank missile, Transport helicopter, Aircraft carrier, Nuclear submarine, Turbofan, Mobile AD system, SAM, SAM, ASW aircraft, FGA aircraft, Turboprop, Anti-ship MI/SSM SAM, Naval gun, BVRAAM, Frigate, FGA aircraft, FGA aircraft, Tank, Portable SAM, Transport helicopter, AEW helicopter, FGA aircraft, Naval gun, Guided Bomb, Anti-ship missile BVRAAM, Anti-tank missile, Turbofan, FGA aircraft, Naval gun, Transport

helicopter, Diesel engine SAM, SAM system, Anti-tank missile, AEW&C aircraft, AEW helicopter, Nuclear submarine, BVRAAM, SRAAM BVRAAM. Russia has been supplying qualitative weapons to India during the Post-Soviet Period also. Indian foreign policymakers have to design foreign policy according to the changing dynamics of the contemporary global world. The above table indicates the significance of India – Russia strategic partnership in the contemporary global world.

Regional Cooperation

The South Asian Association of Regional Cooperation (SAARC) has been established to develop a strategic partnership and cooperation among the members of the SAARC. In recent days, the performance of SAARC is not satisfactory. The uncooperative attitude of Pakistan has created problems in the SAARC. 18th SAARC summit at Kathmandu in the year 2014 could not take place due to the non – cooperation of Pakistan. SAARC has faced several problems after suspension of the 2016 SAARC summit. Due to the terror attack in Uri, India and the other three countries have boycotted this summit (Ramachandran, 2019, Kaura 2020, Meena 2020).

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) has gained much significance in the contemporary global world. India has extensively focused on BIMSTEC during 2014-2019. BIMSTEC leaders also have actively participated in the BRICS outreach summit in Goa in 2016. The BIMSTEC countries have passed a resolution against terrorism and terrorist groups. Further, the BIMSTEC countries have discussed various issues related to climate change, ease of VISA, energy cooperation, poverty reduction (Ministry of External Affairs, 2018). Since Modi has invited BIMSTEC leaders for an oath-taking ceremony in May 2019, and the BIMSTEC leaders have further extended the support for India. It has witnessed a dramatic shift in the diplomacy of the neighbourhood (Basu 2019). Prime Minister Narendra Modi had announced that BIMSTEC will play a vital role in India's neighbourhood policy in 2016 at Goa (Xavier, 2018, Kaura 2020, Meena 2020) and further India had clarified that the objective of BIMSTEC is not to merely isolate Pakistan but also developing trade, economic and strategic partnership among BIMSTEC Countries (Kaura 2020, Meena 2020).

Modi's Foreign Policy towards the USA, Russia

Since 2014, Prime Minister Narendra Modi had developed sustained, special strategic partnership with the USA, which has resulted in the high level of foreign direct investment, and technology. It had finally led to economic growth. Defence and strategic cooperation have been strengthened. India and the USA have signed historical and milestone Indo-U.S. Civil Nuclear Deal (123 agreement) in the year 2008. According to this agreement, India and USA opened its nuclear facilities and have decided to exchange information and cooperation on nuclear energy. They will be using nuclear energy for civilian purposes only (Pant 2019 Parpiani 2019).

India - US Defence Trade

Dynamic developments have taken place in the Indo – US defence cooperation. Indo – US trade has been increased to US\$18 billion in the year 2019. During the first regime of Narendra Modi, India has imported more weapons from America and it has emerged the second-largest arms supplier to India. Indian Prime Minister has developed good defence ties with the USA and it has resulted in the strengthening and modernization of India's military. India has signed unique the Logistics Exchange

Memorandum of Agreement (LEMOA) with the USA in the year 2016. Further, India has signed the Communications Compatibility and Security Agreement (COMCASA) in the year 2018, which has been resulted in the strengthening of the Indo- US defence cooperation (Pant 2019 Parpiani 2019).

India - China

Dynamic changes have been taking place in South Asia. It was witnessed by the cooperation between the two Asian countries in various international organizations and forums. BRICS has been playing a vital role in the South Asian region. Both India and China have been defending similar stands on various global issues despite the conflict in the border areas. India is very unhappy with Chinese stand on Kashmir as well as its investment in China - Pakistan Economic Corridor. China has also been putting pressure in the Doklam and Galwan valley. Satellite images have revealed that China has mobilized its military forces in the Galwan valley and eastern Ladakh (Saran 2019). The relations between India and China have been deteriorated due to the Doklam standoff in the year 2017 and Galwan Standoff at Ladakh in the year 2020 (Pant 2019 Parpiani 2019).

Irritants in India – China Relations

Galwan Standoff at Ladakh

Galwan military standoff in the year 2020 has further deteriorated relations between the two countries. Since 5th May 2020, the military standoff and clashes have been taking place at the Galwan valley and the disputed Pangong Lake in Ladakh (Saran 2019). India and China have exchanged statements blaming each other for the continuing border tensions. New Delhi has described China's Line of Actual Control (LAC) claims as "untenable" and Beijing saying it "did not recognize" the Union Territory of Ladakh" (The Hindu 2020). India has never accepted unilateral claims of China defined 1959 Line of Actual Control (LAC) (Ministry of External Affairs 2020, The Hindu 2020). Further, Jawaharlal Nehru has not accepted the letter of the then Chinese Premier Zhou Enlai related to "the unilateral claims of China's stand on Line of Actual Control (LAC) in the year 1959". South Block officials have explained that Chinese armed forces crossed even 1959 claim line during this summer. PLA moved towards Patrolling Point (PP) 14, the clash in Galwan Valley happened approximately 800 metres west of PP14. China has been violating LAC rules. China foreign ministry officials also have responded to a question related to the infrastructure projects in the Ladakh (The Hindu, September 29, 2020). It shows the intention and attitude of China in the LAC. These statements have emerged out of the border standoff in the Galwan valley. Both sides have decided not to accelerate the situation following the sixth round of talks between Corp Commanders on September 21. Still, there is no conclusion on disengagement or de-escalation of the forces in the border side (The Hindu, September 29, 2020).

India and Russia: Strategic Partnership to Special Privileged Strategic Partnership

Since the 1950s, the Soviet leadership has exported the major arms to Indian and helped India to develop its industrial sector. Indian leaders have analyzed India – USSR relations from the perspective of counterbalancing against the United States, Pakistan and China. India and Russia have similar perspectives on unilateral military intervention, sovereignty and terrorism (Ministry of External Affairs, 2020, Kapoor 2019, Unnikrishnan 2019).

India and the Soviet Union have played a vital role during the cold war in the global world. It has been witnessed by strong defence cooperation and strategic partnership. Due to the disintegration of the USSR, there were some uncertainties between India and Russia. Afterwards, India and Russia again came together and have similar perspectives on various regional and global issues (Ministry of External Affairs, 2020; Kapoor 2019, Unnikrishnan 2019, The Hindu 2000). There have been long-term interests between the two countries. India and Russia have been strongly advocating for the establishment of a democratic and secular multipolar world order in the contemporary global world. The same ideas and debates have been reflected in the interaction between Indian Prime Minister and Russian President at Brasilia, Brazil on November 13, 2019, ahead of the BRICS Summit 2019. Russian President Vladimir Putin has invited India to invest in the natural gas at Arctic region (The Hindu 2000).

India - Russia bilateral relations have been based on multidimensional and unique factors. Special and Privileged Strategic Partnership has been determined by various factors i.e. time-tested friendship and bilateral understanding. Indian Prime Minister His Excellency Shri Narendra Modi Ji has attended 5th Eastern Economic Forum 2019 at Vladivostok from 3-4 September 2019. This visit has brought out many changes in the contours of India – Russia strategic partnership. India is furthering its soft power foreign policy. Modi's doctrine of foreign policy promotes soft power diplomacy through Indian Diaspora, Buddhism and Yoga. Cooperation in the field of science and technology (S&T) is the most challenging area and promising aspect of Indian foreign policy. The bilateral summit at Vladivostok has demonstrated and determined to further the strategic partnership between India and Russia to the next level of partnership. India and Russia have been changing the priorities of foreign policy in the changing geopolitical context of the contemporary global world. India and Russia would like to actively participate in the multipolar global world order, which is based on sovereignty and democracy. The strategic partnership will enhance the cooperation between India and Russia with special reference to countering terrorism, separatism, organized crime, science and technology, illegal trafficking in narcotics, defence cooperation, culture, political relations, trade and economy (Mahapatra 2004).

Prime Minister Shri Narendra Modi has developed a strategic partnership in the contemporary global world. Mr Vladimir Putin has declared that Russia places its relations with India high enough in the strategic framework. The defence cooperation constitutes the cornerstone of India - Russia Strategic partnership in the 21st Century. India and Russia have been playing a dynamic role in various international and regional organizations like the Shanghai Cooperation Organization (SCO); EURASIA (Central Asian Republics); Brazil, Russia, India and China -(BRICS), Russia- India - China Trilateral Cooperation (RIC); Defence cooperation; Joint Development of New Products & Research and GLONASS – Space Cooperation. Cooperation in Science & Technology, Nuclear power project has been a symbol of India-Russia relations. Dynamic trends and changes have taken place with special reference to India-Russia defence cooperation. The nature of defence cooperation has been evolved from the buyer-seller relationship to the joint development of weapons and technologies (Indian Express, 2004).

India – Russia Strategic Partnership (2000)

India and Russia have signed the strategic partnership declaration in the year 2000. This declaration has changed the contours of India – Russia strategic partnership in the contemporary global world. India - Russia strategic partnership has achieved a milestone in the bilateral relations in terms of

defence, security, economy, trade, political, culture. As a part of the strategic partnership, various institutionalized dialogue mechanisms have been operating at official and political levels to strengthen the strategic partnership (Ministry of External Affairs, Government of India, 2020; Embassy of India, Moscow, 2020).

During the last 70 years of the India – Russia bilateral relations, New Delhi and Moscow have developed a strategic partnership in various aspects. Russia has immensely contributed to the development of technology and industrial facilities in India. 75 – 80% of the defence equipment of Indian armed forces has been manufactured in Russia. India and Russia have been jointly working in the various fields i.e., from space exploration to applied medicine. Russians have been extensively using Indian coffee, spices, and tea items. India and Russia have been addressing various global issues in various multilateral forums in the contemporary global world. India and Russia have to ensure that social harmony in the multiethnic, poly- ethnic, inter-ethnic culture should continue and also it has been protected in both countries. Both India and Russia have been firmly dealing with the religious extremism, secessionist movements in the Kashmir & Chechnya (Gleb Ivashentsov Russian Ambassador, Russia International Affairs Council 2020).

Defence Cooperation

The defence cooperation constitutes the cornerstone of India - Russia Strategic partnership in the 21st Century. The Global arms market has forced India to diversify its defence purchases. Russia has been supplying the qualitative military equipment to India. Russia and India have been active partners in the Joint Development of new products and research. i.e. The BrahMos Cruise Missile, 5th Generation Aircraft, Multi Transport Aircraft (MTA). Russia remains a reliable, confidential, trusted friend and strategic partner of India (Bakshi 2006). The interests of Russia and India are complementary in terms of cooperation in the sectors of defence, nuclear, space, science & technology, oil & gas. Russia has been extending its cooperation in various multilateral organizations and the United Nations also.

Table 2: Transfers of major weapons from Russia to India from 2014 to 2019:

Ordered	No. Designation	Weapon Description	Years Weapon of Order	Year Delivery	Delivered
(25000)	9M113 Konkurs/AT-5	Anti-tank missile	(1988)	1992-2016	(25000)
8	A-215 Grad-M 122mm	Naval MRL	(1992)	1997-2009	8
9	Garpun/Plank Shave	Air search radar	(1998)	2000-2016	9
(400)	PJ-10 BrahMos	Anti-ship MI/SSM	(1998)	2006-2019	185
(426)	PJ-10 BrahMos	SSM	1998	2006-2019	(310)
140	Su-30MK	FGA aircraft	(2001)	2005-2019	(132)
6	RBU-6000	ASW MRL	(2003)	2014-2016	6
8	RBU-6000	ASW MRL	(2003)	2014-2017	6
28	BM-9A52 Smerch	Self-propelled MRL	2005	2007-2008	28
123	BMP-2	IFV	2006	2007-2008	(123)
300	T-90S	Tank	2006	2009-2018	(300)

Ordered	No. Designation	Weapon Description	Years Weapon of Order	Year Delivery	Delivered
(14)	BM-9A52 Smerch	Self-propelled MRL	2007	2009	14
(63)	MiG-29SMT/Fulcrum-F	FGA aircraft	2008	2012-2019	(26)
(300)	YaMZ-238	Diesel engine	(2009)	2011-2013	(300)
(216)	PJ-10 BrahMos-A	ASM	(2012)		
25000	9M119 Svir/AT-11	Anti-tank missile	2013	2014-2019	(7500)
236	T-90S	Tank	(2013)		
149	BMP-2	IFV	(2017)		
(200)	Ka-226T Sergei	Light helicopter	(2017)		
4	Talwar	Frigate	2018		
4331	9M113 Konkurs/AT-5	Anti-tank missile	2019		
5175	Igla-S/SA-24	Portable SAM	(2019)		
464	T-90S	Tank	2019		
20	AK-630 30mm	Naval gun	(1990)	1998-2005	20
4	Cross Dome	Air search radar	(1992)	1998-2004	4
(400)	Kh-35 Uran/SS-N-25	Anti-ship missile	(1992)	1998-2004	(400)
7	Garpun/Plank Shave	Air search radar	(1993)	1997-2004	7
(500)	Kh-25/AS-10	ARM	(1995)	1995-2004	(500)
125	Kopyo	Combat ac radar	1996	2001-2006	(125)
(4000)	R-73/AA-11	SRAAM	(1996)	1997-2015	(4000)
(200)	Kh-31A1/AS-17	Anti-ship missile/ARM	(1997)	2000-2007	(200)
3	Talwar	Frigate	1997	2003-2004	3
(150)	3M-54 Klub/SS-N-27	Anti-ship MI/SSM	(1998)	2001-2008	(150)
(1000)	KAB-500/1500	Guided Bomb	(1998)	1998-2007	(1000)
10	Su-30MK	FGA aircraft	1998	2004	10
3	Fregat/Top Plate	Air search radar	(1999)	2010-2012	3
12	MR-90/Front Dome	Fire control radar	(1999)	2010-2012	12
6	RBU-6000	ASW MRL	1999	2010-2012	6
(1500)	9A1472 Vikhr/AT-16	Anti-tank missile	(2000)	2002-2004	(1500)
24	D-30	Turbofan	2001	2003-2004	(24)
3	Il-38SD	ASW aircraft	2001	2008	3
5	Ka-31	AEW helicopter	2001	2003-2004	5
(30)	Kh-35 Uran/SS-N-25	Anti-ship missile	(2001)	2008-2009	(30)
310	T-90S	Tank	2001	2001-2006	(310)
250	V-46	Diesel engine	(2002)	2004-2008	(250)

Ordered	No. Designation	Weapon Description	Years Weapon of Order	Year Delivery	Delivered
12	AK-630 30mm	Naval gun	(2003)	2014-2016	12
8	AK-630 30mm	Naval gun	(2003)	2014-2017	6
(3000)	Kornet/AT-14	Anti-tank missile	(2003)	2003-2006	(3000)
6	Mi-8MT/Mi-17	Transport helicopter	2003	2003-2004	6
1	Gorshkov	Aircraft carrier	2004	2013	1
1	Project-971I/Akula	Nuclear submarine	(2004)	2012	1
(12)	PS-90A	Turbofan	2004	2009-2011	(12)
(28)	2S6M Tunguska	Mobile AD system	(2005)	2008-2009	(28)
(300)	9M311/SA-19	SAM	(2005)	2012-2013	(300)
(450)	9M311/SA-19	SAM	(2005)	2008-2009	(450)
2	Il-38	ASW aircraft	2005	2010	2
16	MiG-29SMT/Fulcrum-F	FGA aircraft	2005	2010-2011	(16)
6)	NK-12	Turboprop	2005	2007	(6)
28	3M-54 Klub/SS-N-27	Anti-ship MI/SSM	2006	2008-2009	(28)
(100)	9M317/SA-17 Grizzly	SAM	(2006)	2012-2013	(100)
16	AK-630 30mm	Naval gun	(2006)	2012-2014	(16)
40	RVV-AE/AA-12 Adder	BVRAAM	2006	2012	(40)
3	Talwar	Frigate	2006	2012-2013	3
18	Su-30MK	FGA aircraft	2007	2007-2008	18
40	Su-30MK	FGA aircraft	2007	2009-2012	(40)
347	T-90S	Tank	2007	2008-2012	(347)
(250)	Igla-S/SA-24	Portable SAM	2008	2008-2012	(250)
80	Mi-8MT/Mi-17	Transport helicopter	2008	2011-2013	(80)
5	Ka-31	AEW helicopter	(2009)	2013	5
29	MiG-29SMT/Fulcrum-F	FGA aircraft	2010	2012-2016	29
10	AK-630 30mm	Naval gun	(2011)		
(100)	KAB-500/1500	Guided Bomb	(2011)	2013-2014	(100)
(50)	Kh-35 Uran/SS-N-25	Anti-ship missile	(2011)	2012	(50)
(500)	RVV-AE/AA-12 Adder	BVRAAM	(2011)	2012-2013	(500)
10000	9M113 Konkurs/AT-5	Anti-tank missile	2012	2013-2017	(10000)
(740)	AL-31	Turbofan	2012	2013-2019	(480)
42	Su-30MK	FGA aircraft	2012	2013-2017	(42)
16	AK-630 30mm	Naval gun	(2013)		
68	Mi-8MT/Mi-17	Transport helicopter	(2013)	2014-2016	(68)

Ordered	No. Designation	Weapon Description	Years Weapon of Order	Year Delivery	Delivered
(250)	YaMZ-238	Diesel engine	2016	2017-2019	(172)
(650)	48N6/SA-10	SAM	(2017)		
(20)	S-400/SA-21	SAM system	2018	(20)	S-400/ SA-21
(500)	9M114 Shturm/AT-6	Anti-tank missile	2019	2019	(500)
(2)	A-50EhI	AEW&C aircraft	(2019)		
(6)	Ka-31	AEW helicopter	(2019)		
1	Project-971I/Akula	Nuclear submarine	2019		
(300)	R-27/AA-10	BVRAAM	2019	(300)	R-27/ AA-10
(300)	R-73/AA-11	SRAAM	2019		
(400)	RVV-AE/AA-12 Adder	BVRAAM	2019		

Source: SIPRI Arms Transfers Database, Information generated on 23 May 2020, Website: https://armstrade.sipri.org/armstrade/page/trade_register.php

Israel: A Maturing Relationship

Since the early 1920's, Arab–Israeli conflict and disagreements with the Jewish national aspirations has prevented India from developing relations with Israel. During post-1992, India has developed good relations with Israel on various defence, security and multilateral issues. Without compromising its stand on Palestinians, India has managed good relations with Israel. Indo – Israel Defence cooperation has been strengthened in recent times. The principal stakeholders in both countries have supported India's position. Sustainability, progress long term stability depends upon the ability of the countries to find out a common concern for cooperation (Taneja 2019, Pant 2019).

India and South Africa

Both India and South Africa have common solidarity in the contemporary global world. They also fought against colonialism and imperialism. India also played a vital role in fighting against racial discrimination (apartheid) in South Africa. The hard-headed economic and strategic imperatives and South Africa's re-entry into international society have strengthened the relations between the two countries. Bilateral ties have developed at a very progressive speed between the two countries. Bilateral economic ties have developed between South Africa and India. These all aspects led to the India - South Africa 'strategic partnership' with special reference to peacekeeping and Indian Ocean. Both countries have developed active engagement in multilateral forums, global governance reforms, intervention climate change and trade. India and South Africa have been playing a vital role in the BRICS (Pant 2019, Hindu 2020)

India – Africa Relations

India and Africa have good relations and entered a new phase in recent times. Africa has allowed

India to access its mineral resources and also East Africa's sea lines of communication. India has been developing investment and trade potential in Africa. India has been extending its diplomatic support for Africa in various global forums (Mishra 2019, Pant 2019).

PM Modi address to the UN General Assembly

Indian Prime Minister Narendra Modi has addressed the United Nations on 26.09.2020 and he has strongly advocated for the reforms in the United Nations (The Hindustan Times, September 26, 2020). Modi has raised questions related to the United Nations response to combat COVID -19 pandemic and assured the global community that India will help humanity in fighting against the COVID -19. Modi has further demanded for the reforms in the charter of the United Nations (The Hindu, 2020; The Hindustan Times, September 26, 2020). Further, he had stated that the United Nations has to play a vital role in the combating Coronavirus in the global world and the UN should not be controlled by one country. Modi had assured the UN General Assembly that India and Neighbourhood are moving with Phase 3 Clinical test to combat the global corona pandemic. (The Hindu 2020).

Indian Prime Minister Narendra Modi hold talks with Rajapaksha

The virtual bilateral summit took place between Prime Minister Narendra Modi and Srilanka Mahinda Rajapaksha on 26th September 2020. India has demanded delegation of the powers by the Srilanka Government to Tamils. Modi has emphasized that constitutional safeguard have to be provided according to the 13th amendment to the Srilanka constitution (The Hindu, 27th September 2020). It will ensure the peace and harmony in the Srilanka. As per the Indo- Srilanka agreement of 1987, the administrative powers will be delegated to the Tamils. 13th amendment will ensure the powers to Tamils. The two leaders have extensively discussed various key issues related to defence, security, trade and investment cooperation. During the virtual meet, Narendra Modi also announced grant assistance of \$15 billion for the promotion of the Buddhist ties with Srilanka (The Hindu, 27th September 2020).

Quad Military Exercises in the Malabar region

India, USA, Japan, have participated in a trilateral Malabar naval exercise in November and December 2020. It has occupied significance since India – China military standoff at Galwan valley. The Quad members have participated in the military exercises in the wake of the India – China worst border tensions in four decades (Times of India, October 19, 2020). Trilateral Malabar exercise has strengthened strategic cooperation among the US, India, Japan and Australia in the contemporary global world. The Indian Defence Ministry has stated that India would like to develop maritime security with the USA, Japan and Australia (Times of India, October 19, 2020).

Multiple Security Driven Strategic Partnerships

Hon'ble Prime Minister Shri Narendra Modi has developed '*Multiple Security Driven Strategic Partnerships*' to strengthen Indian foreign policy in the contemporary global world.

- (i) **Building Capability:** India has strengthened its military capabilities by developing a strategic partnership with the USA, Russia, France and Israel
- (ii) **Networking:** India has developed a global network by developing strategic and global partnership' with the USA, strategic partnership' with Russia and Japan (Kaura 2020).

- (iii) Obtaining Political Support:** India has been designing its foreign policy to develop a strategic partnership with the major powers in the contemporary global world. Russia has supplied significant arms to India and also established industries in the initial independence days. India – USA defence cooperation has deepened by signing 2+2 agreement by India and the US.
- (iv) Avoiding Dependence:** India is diversifying of its arms imports to avoid dependence in the contemporary global world,
- (v) Avoiding entanglement:** India would like to avoid entanglement with the neighborhood and Asian countries (Ian Hall 2015, Barsur 2015, Raja Mohan 2018, Kaura 2020).

Conclusion

India has developed bilateral relations with South East Asia, Middle East, and East Asia. Since India is facing strategic competition from China, India has been developing a strategic partnership with Russia, USA, Australia, and France. Hon'ble Prime Minister Narendra Modi Ji has brought out dynamic changes in the Indian Foreign Policy. Narendra Modi has travelled abroad more often than his predecessors. He has promoted India as a “world guru by propagating an Indian nationalist philosophy. India has strongly advocated yoga, harmony, peace and happiness through soft power foreign policy.

He has invited foreign investment and Foreign Direct Investment (FDI) to develop indigenous manufacturing. India had strengthened its military, naval and missile forces to protect its territory and sovereignty from China and Pakistan. Modi has developed a strategic partnership with the major powers to counter the main rival that is China. India is playing a vital role in the south Asian region. India has remained as more protectionist than globalist, distrusted by its neighbors. India has been strongly advocating the concept of multilateralism and playing a vital role in the contemporary multipolar world. India has been actively engaging with BRICS, SCO, SRRAC, ASEAN, BIMSTEC, Russia – India, China Trilateral Summit (RIC), EU, OPEC, and AU. India has been actively implementing the policy of ‘Act East Policy’ and engaging with West Asia. India is furthering its national interests, diplomacy, economic development, defence cooperation, soft power through global multilateral institutions. India has been actively addressing contemporary global issues at various regional and international forums.

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Impact of Age on Organizational Commitment and Job Satisfaction

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Abstract — The present study aims to examine the relationship between organizational commitment and job satisfaction in male and female engineers working in private organizations of south India. The tools used for the present study are the Organizational Commitment Scale (Allen and Meyer, 1990) and Minnesota satisfaction questionnaire (Weiss and associates, 1967). The questionnaires were administered to 120 male engineers and 105 female engineers working in private organizations. The statistical analysis was done by t-test, correlation, multiple regression analysis and moderated regression analysis. The findings of the study revealed a positive relationship between organizational commitment and job satisfaction in engineers. Adding to this, males and females engineer were found significantly different in organizational commitment and job satisfaction; females were significantly higher on organizational commitment than males. Similarly, females were more satisfied with their jobs than males. Through moderated regression analysis, the ‘age’ of engineers has moderated on the relationship between overall organizational commitment and job satisfaction. The findings of the study have been corroborated with practical implications limitations and future research directions.

Keywords: *Organizational Commitment, Job Satisfaction, Age*

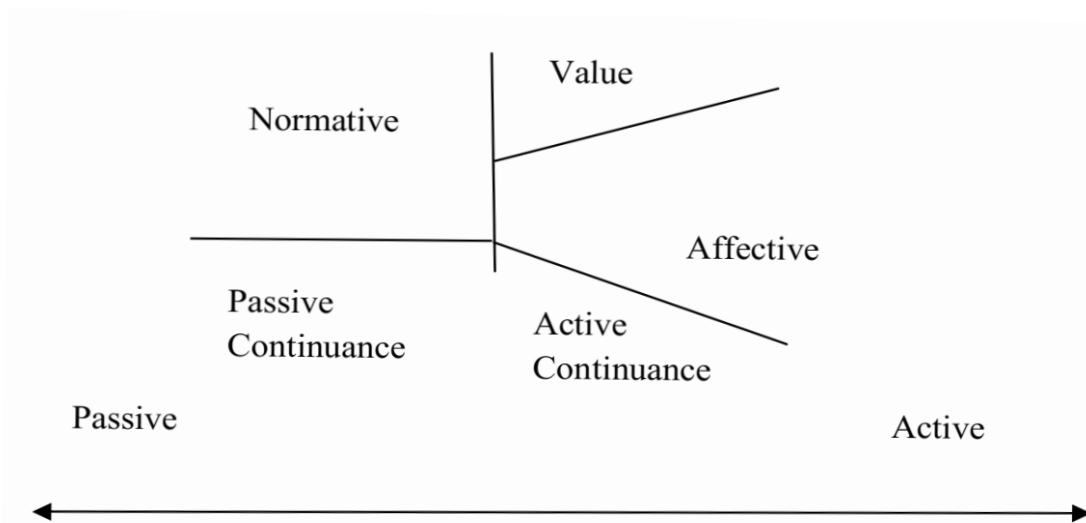
Introduction

In today’s highly competitive business environment, companies value their employees’ job satisfaction and job commitments so that companies can retain their employees, as well as able to maintain their productivity; dissatisfaction from the job is a major cause of absenteeism and so, affect the employee’s job commitment and quality (Rad and Moraes, 2009). Employees having a low level of job-satisfaction and job-commitment show low productivity, absenteeism, job-related stress, burn-out which in-turns into a tendency to quit the job. Organizational commitment is a widely used term in the field of organizational behaviour. It is an individual’s psychological attachment to the organization. It concentrates on the total interest of the employee towards the organization rather than work. A person’s commitment to their job is determined by his/ her level of motivation; this level of motivation guides a person’s behaviour and motivates him to complete the assigned task. When a person committed to the job, he feels a kind of connection with the organization. He wants to fulfill the goal of the organization by imbibing it as his goal. The employee also believes that he is fully fit for the organization and deserves for it.

Meyer and Allen (1991) proposed a three-component model for organizational commitment:

- (a) **Affective commitment:** It is the employee's positive emotional attachment or affection to the organization. An employee commits to the organization because he/she "wants to". This component of commitment may be related to some personal characteristics of an employee like age, gender, length of service, level of education etc.
- (b) **Active Continuance commitment:** A person calculates both the advantages (benefits of continuing the job) and disadvantages (what going to lose when leaves the job) of being a part of any organization. An employee may feel committed to an organization because he perceives a high cost on losing the membership of that organization.
- (c) **Normative commitment:** The feeling of obligation makes a person committed to an organization or work he does. The person feels that he must stay with the organization because it is the best thing to do; even unhappy with his role in the organization, person belief that he will receive 'advance rewards' by investing a lot of efforts. The person shows higher normative commitment in organizations which recognizes their employees' efforts and provides rewards, incentives, and other facilities to them, and committed to employees' well-being.

Wang (2004) proposed five-component model of organizational commitment and divide these components in two major categories: i) active; and ii) passive. Value, affective and active continuance components were kept in active category, whereas normative and passive continuance components were kept in passive category.



Wang's (2004) Five-component model

Prior researches have recognized variables, like role ambiguity, empowerment, job insecurity, leadership, job satisfaction, as well as some demographic variables such as age, gender, education, and organizational tenure as potential predictors of organizational commitment (e.g., Hartley, 1998; Kotze and Nel, 2020; Mathieu and Zajac, 1990; McDermott, Laschinger, and Shamian, 1996; Scales and Brown, 2020; Wu and Norman, 2006; Yucel and Bektas, 2012). Role conflict and ambiguity are the defining factors of a worker's job satisfaction and organizational commitment. Angle and Perry (1983) found extrinsic aspects of satisfaction (based on resource provided by organizations to their employees)

were more strongly associated with organizational commitment, than intrinsic aspects (results of actions and personal attribute of an employee) in blue-collar employees. Similar relationship between organizational commitment and intrinsic work motivation has been well-documented considering the performances of employees in Indian private organizations (e.g., Mishra, 2019; Mishra and Singh, 2009; Sahoo, 2015; Sahoo and Sia, 2015; Sahoo, Sia, Sahu and Appu, 2015)

A study showed that affective and normative components of organizational commitment were positively related with employee engagement, though, continuance component of organizational commitment was not found associated with it in Indian seafaring officers (Rameshkumar, 2020). In Thailand, a study was conducted on the research and development organizations and it was found in the results that learning organization was associated with the organizational commitment and performance. It was also found that organizational commitment was not associated with performance (Khunsoonthornkit and Panjakajornsak, 2018). Yao, Qui, and Wei (2019) conducted a study on hotel employees and revealed that their trust and satisfaction was related to three dimensions of organizational commitment i.e. affective, normative, and continuance commitment. Four components of organizational commitment i.e. attachment, normative, internalization, and continuance were predicted by organizational climate, supervisory behaviour, organizational tenure, and role clarity in a study conducted on Japanese participants (Tao, Takagi, Ishida, and Masuda, 1998).

Organizational commitment is directly related to job satisfaction (Ahmed, Ahmed, and Shah, 2010; Asrar-ul-Haq, Kuchinke, and Iqbal, 2017; Mathur and Salunke, 2013) resulting in the significant performance of the employee, like absenteeism, turnover, and organizational citizenship behaviour (Crossman and Abou-Zaki, 2003; Mount, 2006). Job satisfaction is a feeling when an employee evaluates the characteristics of his job (e.g., having job stability, comfortable work-life balance and growth in their career). Locke (1976) defined Job Satisfaction as “*pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences*”. People who are more satisfied with their jobs have showed increased motivation, performance, and overall happiness (e.g., Iaffaldano and Muchinsky, 1985; Piccolo, Judge, Takahashi, Watanabe, and Locke, 2005; Scheers and Botha, 2014). There are three main components of job satisfaction: cognitive (evaluative), affective (emotional) and behavioural components. The evaluative component generally means “an individual’s overall response to the organization in which he works”, or simply it can be defined as the response given by the employee when asked: “how satisfied are you with your job?”

Job satisfaction is affected by some stressors (Johnson, Cooper, Cartwright, Donald, Taylor, and Millet, 2005; Lambert, Jiang, Liu, Zhang, and Choi, 2018; Sweeney and Quirin, 2009) for say, role overload, role ambiguity, role conflict (Antonioni, Davidson, and Cooper, 2003; Leather, Beale, and Sullivan, 2003; Yousef, 2002), and other factors, like the pressure of responsibility (Correa and Ferreira, 2011), type of job: temporary or permanent (Cuyper and Witte, 2006; Cuyper, Notelaersn and Witte, 2009), gender (Crossman and Abou-Zaki, 2003); workplace facilities like hygiene (Maidani, 1991), office type (Danielsson and Bodin, 2008); any kind of discrimination (Ensher, Grant, Vallone, and Donaldson, 2001), demographical variables like age, education, experience on the job (Mishra & Singh, 2017; Suliman, 2007), and of course, salary (Okpara, 2004; Nguyen, Taylor, and Bradley, 2003).

A positive linear relationship between organizational commitment and job satisfaction is well documented in previous literature, for ex., Baughand Roberts(1994) found that a person high on organizational commitment was found highly satisfied and productive in their jobs. Srivastava

(2014) found a positive relationship in these two constructs in private sector managers; locus of control and trust has moderated the relationship of these two. Similar finding was also reported by Al-Ameri (2000) on a sample of private hospital nurses: more satisfied nurses were more committed to the hospitals than those nurses having low job satisfaction. Hashim (2015) conducted a study on engineers of Malaysian organization and found job satisfaction as one of the factors that contribute to organizational commitment. Yousef (2002) found that organizational commitment significantly mediates the relationships of leadership behaviour with job satisfaction and performance of the employee. A significant difference was found between engineers of private and government organizations on job satisfaction and organizational commitment (Bhardwaj, Chouhan, and Meena, 2014). These differences were observed by concerning employee's role, qualification and manifestation.

It has also found in literature that the causal order of these two constructs is contradictory. Some studies reported that job satisfaction is antecedent to organizational commitment (Bateman and Organ, 1983; Koch and Steers, 1978; Vandenberg and Lance, 1992), whereas some other researchers claim that job satisfaction is the predecessor of commitment (Williams and Hazer, 1986). It is not conclusive at all (Nguni, Slegers, and Denessen, 2006). Organizational commitment is directly related with the personality traits of the participants (Erdheim, Wang, and Zickar, 2006), in the present investigation, commitment is considered as predictor of job satisfaction concerning it as antecedent of job satisfaction.

H1: There would be a positive linear relationship between organizational commitment and job satisfaction in engineers of private organizations.

Evidences from previous studies reveal that chronological age is having positive linear relationship to the job satisfaction (Rhodes, 1983). This indicates that younger employees are generally less satisfied with their jobs than older ones. Similar results were found in the case of organizational commitment too (Allen and Meyer, 1993; Meyer, Stanley, Herscovitch, and Topolnytsky, 2002; Salami, 2008). Older employees see their previous years as an investment in the organization and they have more affective attachments to their organization (Matheiu and Zajac, 1990; Suliman and Lies, 2000). Finegold, Mohrman, and Spreitzer (2002) revealed that older employees have satisfaction of job-security which leads them to have greater commitment than younger employees. Though, it was also found that these relations differ from different organizations. For ex., Kumar and Giri (2009) study on banking and telecom employees of public and private Indian organizations and found organizational commitment and job satisfaction differed significantly across different career stages of employees. Since, age is related with both the constructs, it is quite possible that it might moderate the relationship of these two.

H2: Age would affect the relationship of organizational commitment and job satisfaction significantly.

As far as concerned with the gender differences in job satisfaction and organizational commitment, there are contradictory findings available. Hodson (2016) found that women were more satisfied than men in spite of objectively inferior jobs, whereas, Mason (2010) conducted study on more than 13000 participants from 130 organizations of America and found no differences in male and females. Sousa-Poza and Sousa-Poza (2003) found that the female's job satisfaction was declining subsequently in previous decade (1991 to 2000), but no change was observed in males' job satisfaction. Okpara, Squillance, and Erondu (2005) found that female university teachers were more satisfied with their work and coworkers, on the other hand, males were more satisfied with their pay, promotion,

supervision and overall satisfaction; they also found that rank of the employee were significant in explaining this gender differences. Similarly, some researchers did not found gender differences in the organizational commitment (Al-Ajmi, 2006; Khalili and Asmawi, 2012; Marsden, Kalleberg, and Cook (1993).

H3: There would be a significant difference in organizational commitment in male and female engineers.

H4: To examine the significance of the difference in job satisfaction in male and female engineers.

Methods

Being satisfied and committed in a job is very important for both the organization and an employee. Job satisfaction and organizational commitment are the two positive variables that individually affect work efficiency. It is clear from the previous studies that more satisfied employee shows more positive feelings, thoughts, and actions which directly affect the turnover and productivity of the work. Considering that other studies on the relationship between job satisfaction and organizational commitment have been performed, relatively little information is known about the relationship between job satisfaction and organizational commitment, especially among engineers employed in private organizations. The current research, therefore, carried out to address the question of whether employee satisfaction and organizational commitment among male and female engineers employed in private organisations are significantly related or not. Findings of this study can be used for making new scales to recruit the best employees for the company. The findings could also help the organization improve the overall turnover and provide good training for the employees.

Variables

It was found in the studies that organizational commitment is directly related with the personality traits, so, in the present investigation, it has been assumed that it will predict the job satisfaction of the participants. Therefore, organizational commitment is considered as a *predictor variable*, and job satisfaction as *criterion variable*. Age and gender are also found a potential predictors of job satisfaction, so, these two are also considered here as *predictor variables*. Age is also a predictor of organizational commitment and job satisfaction, so, here it is treated as *moderator variable* in the relationship of these two variables.

Participants

The participants selected for this study were young male and female engineers working in private organizations from different engineering field like software engineers, mechanical engineers, civil engineers, electrical etc. Participants were approached randomly from these fields, majorly from organizations located in Bengaluru and Hyderabad cities. A total of 225 participants were given responses, out of them, 120 were male and 105 were female engineers. It was well established fact that age is one of the predictors of organizational commitment and job satisfaction, so in the present study, only younger engineers (age below 40 years) were considered as target population (Ng and Feldman, 2008). Additionally, it is a common consensus that employees from public sector has greater job-security and hence, lesser intension to leave the organization; they may affect the commitment as well as satisfaction. Therefore, only private sector engineers were selected for the study.

Measures of the Study

In the present study, the researcher tries to study the different variables like job satisfaction and organizational commitment, the following measures were administered on the target sample:

Organizational Commitment Scale (Allen and Meyer, 1990)

This scale is comprised of 18 items which measure 3 dimensions of organizational commitment namely affective commitment, continuance commitment and normative commitment. The scale is comprised of 18 items, out of them, 13 items were true keyed items and 5 were reverse keyed items. It has 5-point Likert type responses, range of scoring is from 'strongly disagree' (1) to 'strongly agree' (5). This scale has been widely used as a tool for measuring organizational commitment due to its high value of reliability and validity. Allen and Meyer (1991) registered an alpha value of 0.87 for affective commitment, 0.79 for normative and 0.75 for continuance dimension of job commitment. Dunham, Grube and Castaneda (1994) recorded an alpha range of 0.74 to 0.84 for affective participation, 0.67 to 0.78 for normative engagement and 0.73 to 0.81 for continuing engagement. Meyer (1997) recorded 0.87 for the scale of affective commitment, 0.75 for the scale of continuing engagement and 0.79 for the scale of normative engagement. Martin (2007) reiterated the Questionnaire on Reliability for Organizational Engagement.

Minnesota satisfaction questionnaire (Weiss, Dawis, England, and Lofquist, 1967)

To measure the job satisfaction, short version of Minnesota Satisfaction Questionnaire (MSQ) having 20 items were used in the study. Responses were rated on a 5 point Likert scale. Martins (2008) proposed the translated version of Weiss and colleagues (1967) 20 item scale which was used to obtain the data in the present investigation. High scores represent the high level of job satisfaction. The internal consistency shows the alphas ranging from 0.87- 0.92. The construct validity of this scale was established by using the MSQ on different occupational groups to differentiate job satisfaction at the 0.001 significance level.

Procedure

The researcher contacted participants and discussed the purpose, importance, nature and application of the study. They were told that since it was a research work, their responses should be sincere and the assurance was given to each employee that the gathered information would be used only for research purposes and everything including their identity would be kept confidential. The tool to measure the variables under the study was administered to the subject via a Google form. Doubts if any were cleared. For ethical considerations, data were collected after verbal consent of the participants; only necessary biographical data were collected.

Results

To analyse the obtained data, t-test, coefficient of correlation, multiple regression analysis and moderated regression analyses were used. Obtained data were entered and analysed with the help of SPSS 24.

Table-1 shows that Job satisfaction ($M = 73.11$, $SD = 14.19$) was significantly positively correlated with organizational commitment ($M = 60.20$, $SD = 10.27$; $r = .58$, $p < .01$), and its two dimensions: affective commitment ($M = 22.29$, $SD = 5.21$; $r = .48$, $p < .01$) and normative commitment ($M = 20.75$, $SD = 4.96$; $r = .58$, $p < .01$). Job satisfaction is also significantly positively correlated

with gender (responses coded as 1= male; 2 = female) ($r = .26, p < .01$) which shows that females were more satisfied with males. Similar results were obtained in the relationship between gender and organizational commitment ($r = .24, p < .01$), along with its dimensions: affective commitment ($r = .20, p < .01$); and normative commitment ($r = .33, p < .01$). Surprisingly, age was not found correlated with job satisfaction and organizational commitment.

Table 1: Descriptive statistics and correlation coefficients

Variables	M	SD	1	2	3	4	5	6
1 Age	26.12	4.20	1					
2 Gender [#]	1.47	0.50	-					
3 Job Satisfaction	73.11	14.19	.093 [-0.04, 0.22]	.261** [0.14, 0.38]	1			
4 Affective Commitment	22.29	5.21	.069 [-0.06, 0.20]	.203** [0.07, 0.33]	.478** [0.37, 0.57]	1		
5 Normative Commitment	20.75	4.96	.110 [-0.2, 0.24]	.328** [0.21, 0.44]	.575** [0.48, 0.66]	.607** [0.52, 0.68]	1	
6 Continuance Commitment	17.16	3.31	.031 [-0.1, 0.16]	.072 [0.20, 0.06]	.127 [-0.04, 0.25]	.235** [0.11, 0.36]	.151* [0.02, 0.28]	1
7 Overall Job Commitment	60.20	10.27	.097 [-0.03, 0.23]	.236** [0.11, 0.36]	.557** [0.46, 0.64]	.867** [0.83, 0.90]	.834** [0.79, 0.87]	.512** [0.41, 0.60]

* indicates $p < 0.05$. ** indicates $p < 0.01$; Values in the square brackets indicate the 95% confidence interval for each correlation [lower, upper]

Correlation between gender and other continuous variables were calculated by using crosstab (Normal by Interval Eta test), coding of the variable as 1 = Male, 2 = Female

A multiple linear regression (stepwise) was calculated (Reported in table-2) to predict the job satisfaction based on age, gender, and organizational commitment (with its' dimensions). A significant regression equation was found [$F(2,222) = 61.51, p < .001$]. The constant value was found 33.72 and Standardized β was found significant for normative commitment [$\beta = .45 (t = 6.65, p < 0.001)$] and affective commitment [$\beta = .21 (t = 3.02, p < .01)$]. This table also indicates that the 33 per cent variance in the scores of job satisfaction is accounted for by normative commitment and 3 per cent variance in the job satisfaction is accounted for by affective commitment.

Table 2: Multiple Regression Analysis (stepwise) summaries for predicting job satisfaction based on age, gender and organizational commitment.

Variables	B	CI (95%)	F	R	Adj. R ²	ΔR^2	β	t
Constant	33.72	26.39, 41.05	61.51**					9.06**
NC	1.29	[.91, 1.67]		.58	.33	.33	.45	6.65**
AC	.57	[.20, .94]		.59	.36	.03	.21	3.02**

NC = normative commitment; AC = affective commitment; * indicates $p < 0.05$. ** indicates $p < 0.01$

Table-3 clearly indicates that there was significant difference between the scores of job satisfaction ($t_{223} = -4.08$, $p < .001$), affective commitment ($t_{223} = -3.09$, $p < .01$), Continuance commitment ($t_{223} = -5.06$, $p < .001$), and overall organizational commitment ($t_{223} = -3.63$, $p < .001$) of male and female participants; these values shows that females were scored significantly different (higher side) than male participants.

Table 3: t-test of the scores of male and female participants on job satisfaction and organizational commitment (with its' dimensions)

Variables	Male		Female		t-test
	M	SD	M	SD	
Job Satisfaction	69.65	14.54	77.07	12.73	-4.08***
Affective Commitment	21.32	4.95	23.40	5.11	-3.09**
Normative Commitment	19.23	3.78	22.49	5.55	-5.06***
Continuance Commitment	17.38	3.78	16.90	2.66	1.11
Overall Org. Commitment	57.94	9.21	62.79	10.83	-3.63***

* $p < .05$, ** $p < .01$, *** $p < .001$

The moderated regression analysis was computed to know whether age moderates the relationship of organizational commitment and job satisfaction. As suggested by the Aiken and West (1991), all the measures were firstly converted into standard z scores (those are on a continuous scale) and then cross product of predictor variable and moderator were calculated. Table-4 indicates that age is significantly moderate the relationship of organizational commitment and job satisfaction ($\beta = .113$, $p < 0.05$), dimension wise analysis indicates that none of the dimension of organizational commitment having a relationship with job satisfaction in the influence of age. These findings partially support the hypothesis H2.

Table 4: Moderating effect of age on the relationship between organizational commitment and job satisfaction

Model	Variables	β	T	R ²	ΔR^2	ΔF	F
Moderator: AGE							
1	AC	.474**	8.036	.232	.232	33.547**	33.547**
	Age	.061	1.030				
2	AC	.476**	8.081	.238	.006	1.806	23.048**
	Age	.050	.843				
	AC X AGE	.080	1.344				
Moderator: AGE							
1	NC	.571**	10.341	.331	.331	54.910**	54.910**
	AGE	.030	.550				
2	NC	.568**	10.278	.335	.004	1.355	37.117**
	AGE	.004	.065				
	NC X AGE	.069	1.164				

Model	Variables	β	T	R ²	ΔR^2	ΔF	F
Moderator: AGE							
1	CC	.125	1.879	.024	.024	2.757	2.757
	AGE	.089	1.349				
2	CC	.128	1.92	.025	.001	.269	1.922
	AGE	.099	1.436				
	CC X AGE	.036	.519				
Moderator: AGE							
1	OC	.553**	9.879	.311	.311	50.198**	50.198**
	AGE	.039	.706				
2	OC	.556**	10.004	.324	.012	3.953*	35.228**
	AGE	.014	.251				
	OC X AGE	.113*	1.988				

*p ≤ .05 **p ≤ .01

Note- AC: Affective Commitment, NC: Normative Commitment, CC: Continuance Commitment, OC: Overall Organizational Commitment.

Discussion

The current study attempts to investigate the relationship between organizational commitment and job satisfaction of young male and female engineers working in private organizations under the influence of age. When a person is committed to his/ her organization, perform a better way and well satisfied with the job. The first objective of the current study was to explore this fact. Results shown in the table-1 indicate that job satisfaction was significantly positively correlated with the organizational commitment and its dimensions (except continuance commitment). It indicates that when a person feels committed towards the organization, also gets satisfaction with the job. Most of the participants were very young, their average age was just 26 years, for most of them their job was the initial job, therefore, they showed affection as well as the obligation to their organization. Further, multiple regression analysis was performed to predict job satisfaction with the help of scores of age, gender, and organizational commitment. The result indicated in the table-2 reveal that affective and normative commitment is a significant predictor of job satisfaction. Overall commitment scores were the sum of all three dimensions of it, where continuance commitment's scores were also added in it, maybe for this, it has not emerged as a predictor of job satisfaction. If older participants would have been selected in the study, it might be expected that the results may be consistent with the available literature.

The result of the present investigation is supported by the studies (Lumley, Coetzee, Tladinyane, and Ferreira, 2011; Bilgin and Demirer, 2012) which reported similar findings and showed a positive significant relationship between job satisfaction and affective commitment. Job satisfaction and Commitment are linked to the attitude of a person to their work, so a rise in the degree of organizational commitment would also impact an increase in job satisfaction which is the ultimate goal of a person working in an organization. Yucel and Bektas (2012) also confirmed the positive relationship between these two variables on teachers' sample. Luz, de Paula, and Oliveira (2016) found that these two are

the essential constructs related to the intension to leave the organization which is always a challenge for any organization. Therefore, the hypothesis expressing the relationship between organizational commitment and job satisfaction is accepted in the study.

The second objective of the study was to explore the influence of age in the relationship between organizational commitment and job satisfaction. For this, the moderated regression analysis was performed. Results listed in the table-4 indicate that age is significantly moderate the organizational commitment and job satisfaction of the employees. In some studies, it was found a nonlinear relationship of age in the commitment and job satisfaction relations. It expresses that different aged employees' commitment predicts job satisfaction differently (Yucel and Bektas, 2012). Cohen (1993) also found a U-shaped relation between age and commitment. Riordan, Griffith, and Weatherly (2003) reported that a person who spends time in an organization is more likely to involve emotionally with the organization resulting in increased commitment to the organization. This study was conducted on only the younger population, even their average age was just 26 years, so most of them were very young. This confirms the cause that age did not emerge as a strong mediator of organizational commitment and job satisfaction relationship.

Finally, there was another question that remained unexplored about the gender differences in the scores of male and female's scores of job satisfaction and organizational commitment. Previous researches reveal that perceptions about job satisfaction as well as organizational commitment are different in males and females. Males and females were satisfied with different predictors of job satisfaction. Results of the t-test reported in the table-3 reveal that there is a significant difference among the scores of job satisfaction and organizational commitment of male and female participants (except continuance dimension of organizational commitment). Result also indicates that females scored high on job satisfaction. Female engineers from the private sector tended to more satisfied with their jobs than their male counterparts. It was also found in some studies that female employees appear to have a higher level of organizational commitment. A study by Heywood, Bender, and Donohue (2005) showed that women report higher job satisfaction in women dominated the workplace in the US due to job flexibility. Increased feelings of community and pride, structures that facilitate individual mobility and career development such as promotion ladders, high earnings, and fringe benefits can be the reason behind high organizational commitment and job satisfaction among female engineers.

In Indian organizations, males are dominating over females in most of the sectors; they are the dominant family member too, therefore, females are bound to search for a job in the restricted geographical area where her male family member is working (husband, father or son). Females show greater satisfaction by getting a decent job (at least consistent of their capability) and does not expect much as compared to male counterparts. Due to narrowed available opportunity, irrespective of nature of the job, females evaluate the great value of their job. Hodson (1989) says that male and females refer different comparison groups while evaluating their jobs, males refer to the highly competitive and similar group for comparison; females have different expectations from their job, so evaluate it accordingly. Women weigh relations with coworkers more heavily than men. Another possible explanation for women's high job satisfaction is they may rely on the family as an alternative source of satisfaction and therefore evaluative work-related concerns in a softer light. Crosby (1982) has reported that workers compare themselves to someone of the same sex in appraising their jobs. The employment situation of women's mothers or other women in the family when they were growing up may provide a meaningful reference. If a women's mother was not employed, her reference group is

likely to be women who work at home which makes that women feel more successful and satisfied with their job.

Apart from job satisfaction, females scored higher in organizational commitment and its dimensions; except continuance commitment (though the difference was not significance). Females are generally sincerer than males; they are more deeply attached with their positions, duties, and organization. Continuance commitment is the need for an employee to stay in the organization. The possible causes to remain to stay in the organization may be related to salary, fringe benefits, location of the organization or other factors which employee will lose when he/ she quit the job/ change the job. In the present study, most of the participants belong to the young population. Either they started their career just before 2 to 4 years back, so they feel more opportunities available in the market. One another possibility is, most of the participants were working in the Bengaluru and Hyderabad cities where they get different opportunities. Employees switch their jobs in initial phases of their career to get a better salary and other financial rewards, or to get a job in better and reputed organization where they could get better opportunities to develop skills. Therefore, there was no difference was found in the scores of continuance commitment dimension of organizational commitment of male and female engineers.

Conclusion and Limitations

Findings of the study suggest that organizations should make sure the employee's performance and recognize and respect their good work. This will help to develop more commitment resulting in high satisfaction to the job; organizations can improve the overall turnover and cut the recruitment and training cost. This study has some limitations too, one of the important limitations is related to the generalization of the findings; though, all the participants were from southern areas of the country only. One more thing is related to the type of organization if one type of organization was selected (for say, software), a clearer picture could be obtained. Nevertheless, findings suggest that organizational commitment is one of the dominant predictors of job satisfaction in private sector engineers. Age was found as partially moderate the relations of job satisfaction and job commitment, also, gender played a key role in it; female engineers were more satisfied and more committed to their organization in comparison with male participants.

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Histogenesis, Growth and Development of Amarkantak Town

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Abstract — Amarkantak is a prominent sacred place in central India and has evolved as an abode of God in the context of hindu mythology that is why the place attracts devotees from different parts of the country. The nuclei of the settlement are closely associated with shrines and water bodies. The Narmada temple is the chief nuclei of the settlement. Thus, the religio-cultural and social institutions along with the topographical features played a vital role in the evolution of the town and shaped its settling processes, internal structure and spatial spread dimensions. The growth of the town is not unidirectional and continuous, but it proliferated in different parts and phases. The paper is an attempt to study the histogenesis and growth pattern of the town in terms of the development of residential areas and the establishment of social, cultural, religious and economic institutions. These cultural features and processes are closely related with the geo-environmental conditions. Thus, the study is very useful to the students and researchers of urban geography as well as planners and administrators.

Keywords: *sacred place, town, histogenesis, nuclei, and growth pattern*

Introduction

Settlements are the prominent human created features on the surface of the earth. The moderation and alteration of the settlements and the architectural style of dwellings clearly reveal the cultural development and dimensions of human society. Geo-environmental conditions and historical factors considerably affect the evolution, growth and spatial organization of human settlements. “The term ‘town’ refers to a compact settlement, larger than a village, having marked secondary and tertiary functions with some form of municipal administration or a notified area committee, with a community pursuing an urban way of living” (Mandal, 2000). Amarkantak has emerged as an earlier settlement at the place of origin of the river Narmada while it got status as town, recently. The town is in transition phase between village and city where rural characteristics are declining meanwhile gaining urban attributes.

“The histogenesis and morphological study of any city is necessary to know how surface configuration and socio-cultural factors effect on growth and expansion of cities and what will be the trend of expansion in future” (Prasad, 2014). Histogenesis refers historical process of origin of a settlement that starts from a single nucleus. The nucleus takes place first as prominent cultural feature

like fort, religious place, lake, etc. which attracts human habitation in its surroundings. Thus, the origin of settlement begins with the concentration of population close to the nucleus. Next stage is the formation of settlement which is known as patternogenesis. It refers the development of multiple nuclei in a place which plays a vital role in attracting people to settle in its vicinity. The skeleton of the settlement appears with the connection among such different nuclei through development of routes. Morphogenesis is the stage where pattern of roads/streets and arrangement of buildings take place clearly. In this phase of settlement formation, different types of land uses depict apparently, and urban functions agglomerated in specific areas.

The main nucleus of Amarkantak town is the Narmada temple, the origin point of holy river Narmada that played a pivotal role in settling people here especially the *prohits*. The business activities also took place in the vicinity of the temple along with their residence while tribal and scheduled caste peoples occupied marginal areas of this main settlement and grouped in other separate localities. Other nuclei also emerged in various parts of the town especially as social, cultural and economic institutions as well as administrative set-up. These caused clustering of houses in various localities. The roads connect the nuclei and attracted linear development along the routes. “Cities are the focal points in the occupation and utilization of the earth by man. Both a product of and an influence on surrounding regions, they develop in definite patterns in response to economic and social needs” (Harish and Ullman 1945).

Amarkantak is situated on Maikal range of central India and is famous for the origin of three holy rivers namely the Narmada, the Sone and the Johila. The settlement is surrounded by dense *Sal* forest. The place Amarkantak comes in Anuppur district of Madhya Pradesh and is located at 22°67' N to 81°75' E. It has an average elevation of 1048m (3438ft) above mean sea level. Amarkantak possess the status of town and has local body governance as *nagar panchayat*. The Primary Census Abstract, India (2011) reported that the total population of the town is 8,416 and the sex ratio is calculated as 864 females per 1000 male. This is very low in relation to other towns of Madhya Pradesh and the ratio is relatively better among the age group 06, i.e., 931. Eighty percent population of the town is literate. Half of the population of the town is consisted of two ethnic groups namely STs (43%) and SCs (6.16%). The work participation rate of the town is 36.6%. The population of the town is largely characterized by the service sector as 84% of working population engaged in other than the household industry. Cultivators constitute only 2.2% of the total workers while agricultural labourers are 9.28% and rest 4.77% people are engaged in household industry.

“Urban growth is the actual increase in population of an area or a region or a country over time, expressed in a number, whereas urbanization is the increasing proportion of population living with in urban areas which would be given most likely in a percentage of the total population or ratio” (Sujathamma, 2019).

The decadal growth of population at Amarkantak town varies from 10% (1991) to 125% (1971). The highest decadal growth is recorded 125% in 1971 as the opening of HINDALCO and BALCO mines at Amarkantak in 1960s which attracted people for jobs at new avenue. The mining activities decreased after 1980 and BALCO closed in 1992 while HINDALCO continued up to 2002. Hence, the growth rate of population slowed down but numbers were increased. The growth of population after 1990 is associated with tourist and religious activities and Amarkantak came again in prominence with the establishment of a Central University in 2008. The modern development of the town is associated with mines which attract variety of services. Mitra (1994) has been studied that population growth

in Indian cities has quite high and also pointed that the rate of growth of city population has high to generate maximum supplies of labourers.

Table 1: Growth of population in Amarkantak town from 1961 to 2011

Year	Population	Percentage of Decadal Growth
1961	1,095	-
1971	2,465	125.11
1981	4,465	81.14
1991	4,936	10.55
2001	7,082	43.48
2011	8,416	18.83

Source: District Census Handbook 1961, 1971, 1981, 1991, 2001 and Primary Census Abstract, 2011, Census of India.

Objective of the Study

To understand the histogenetic evolution of the town and know how topographical configuration, water bodies, religious places and other social and economic institutions affected the evolution and growth of the town.

Data Base and Methodology

The study is primarily based on field study. Secondary sources of data are also used as valuable source of information. The information of the establishment of specific institutions is collected directly from the field. Various social, cultural and religious aspects of the town are studied during the field study meanwhile open-ended discussion made with local people and personnel from different institutions to collect relevant information. The population data is taken from the primary census abstract. The map of histogenetic evolution and growth of Amarkantak Town is prepared based on map supplied by the *Nagar Panchayat*, city development plan and field-based study. The latest technology is used in the preparation of the map.

Evolution of Amarkantak as a Settlement

“Keeping the view of space-time continuum, any habitat may be treated as a dynamic product of various environmental situations, human achievements and processes. In this respect, cities typically develop over a long period of time” (Prasad, 2017). Verma (2008) stated that the towns came into being as early as 6000-5000 B.C. while the real town cult began around 3000 B.C. The phenomenon of the origin of towns is associated with river valleys where the surplus food-grain production took place and certain group of people came up with something different skills and professions such as trading, art, writing, accountancy as well as knowledge of calendar and bureaucracy. The historical background of Amarkantak is very old about 6000 year back. Various kings have ruled Amarkantak. The earliest Suryavanshi king Samrat Mandhata (ancestor of Lord Ram) has founded the town in the valley of *Riksh parvat*. The son of Mandhata has given the title of Narmada to the river. In more recent history of this area was given in dowry to the Kalchuri king by the Chedi king (10th to 11th century).

The Kalchuri king Karandev (1042-1072 AD) had constructed temples close to Surajkund. In 1808, Amarkantak was ruled by the king of Nagpur and later come under foreign rule.

The rapid growth of the town was started from early 1960s with the opening of bauxite mining activities by the HINDALCO and the BALCO companies at Amarkantak. This is the turning point as to sudden construction works came into existence and lure people to stay here. People of surrounding areas attracted towards mining companies those who were earlier engaged in primary production. Thus, the population of Amarkantak has suddenly had grown 125% during the decade 1961 to 1971. The long period of 40 (from 1962 to 2003) years of mining at Amarkantak has brought a lot of change in the place with the construction of residential colonies, schools, and roads along with the urban facilities like electrification, market and bank. Transport facility and employment opportunity both have impacted as people settled in Amarkantak even they constructed their own houses nearby mines also and various localities came into existence like Barati (*Adiwashi mohalla* known as Katjugram ward), HINDALCO colony, Naka, Bandha, Khurkhuridadar (BALCO). The market of Amarkantak expanded with the growth in mining activities as salary holders were major consumers of goods and services. Economic conditions of local people come down after the close of mining activities due to increase in the rate of unemployment. It has negative impact on market and other developmental activities of the town. Many unemployed people got engaged in the construction of ashrams, roads, temples, buildings and business outlets, etc. “Urban expansion as a dynamic process of land use change is a complicated social/economic phenomenon. It may be linked with details related to topography, transportation, land use, social structure and economic type, but it is generally related to demography and economy in a city” (Li et al. 2003).

Amarkantak is developed as a tourist place along with the pilgrimage. That is why the movement of people increased on this place. Business activities are improved along with over all development of the town which affect on the socio-economic conditions of dwellers. Main constructions of Amarkantak are Kalyan Seva trust, Mritunjay Ashram, Shantikuti, Chandika Ashram, Gayatrishakti Peeth, Shree Digamber Jain temple and the ashrams of Sukhdevanand, Hariharanand and Barfani. In the year 2008, Indira Gandhi National Tribal University Amarkantak is established at Amarkantak and the higher education at the town is further extended with the establishment of Kalyanika B.Ed. College and the Regional campus of Makhan Lal Chaturvedi University. Four higher secondary schools and 11 *Aaganvadi* centres are developed in the *nagar panchayat*. Thus, town has emerged as a famous cultural and educational centre in central India. These educational institutions and tourists’ attractions brought a lot of changes in the development of the town.

Most of the population of the town is concentrated at the left bank of the river Narmada. The Pandan *mohalla* and many other residential pockets emerged in the left bank of the river namely Tikari *tola*, Bank *tola*, Naka and Bandha while the Jamuna *Dadar* and Kapila *Sangam* are evolved at its right bank. The persons belong to the *purohit* communities are settled in the Pandan *mohalla*, surrounded by business communities and the localities at margin are inhabited by the tribal and scheduled caste communities. Many tribal people inhabited in Barati, Jamuna *dadar* (Baigan *mohalla*), and *Adiwasi mohalla*. The peripheral localities are sparsely inhabited in forest area and many households of these localities are engaged in agriculture and animal husbandry. The houses of tribal people are constructed with the locally available materials like soil, timber, clay, stone, etc. “Areas within the cities are more influenced by developments and decisions on higher spatial level. Geographers and sociologists now agree that patterns of concentration and segregation changes as result of the interaction of the

individual household decision with a diversity of structures and developments on diverse spatial levels. Societal processes like economic restructuring on a global level have their impact on local situations and development” (Karimi et al., 2013).

Evolution and Growth of the Town

“Evolution and growth of town is reflected in the nature and layout of its landscape elements, i.e. land use, buildings, and town plan. These elements have their roots in the past and have evolved and developed due to continued interplaying of socio-cultural, economic, political, technological, physical as well as environmental factors” (Mishra and Sharma, 2011). Historical background of Amarkantak town shows that how constructions took place due course of time. These constructions are associated with religious places as temples, hermitages (*ashrams/kuti*), residential houses, business outlets and other institutional set-ups. The constructions related with religions/sects are having specific characteristics. “Towns where religion is important have many religious buildings, specialist shops selling religious books and pictures, or supplying candles or joss sticks” (Leong and Morgan, 1982). The plateau platform situation of Maikal range and origin of river Narmada are the chief bases of the settlement evolution at Amarkantak. The growth of the town is affected by its cultural importance. The histogenetic nucleus of the Amarkantak is Narmada temple and residential houses are constructed closely to this important cultural feature which is known as *pandan mohalla*. The settlement is expanded outward in different manner as per the suitability of topography and the location of sacred places. ‘The old town grew up spontaneously at certain advantageous sites and situations, many towns in recent time have been built from nothing according to the plans of architects and planners’ (Leong and Morgan, 1982). The evolution and growth of the settlement along with the morphology of the town may classify into three historical phases as per its development which are as follows:

1. Town before 1900 AD
2. Growth of the town from 1900 AD to 1947AD
3. Growth and Development of the town after Independence
 - i. Town from 1947 AD to 1980 AD
 - ii. Town from 1980AD to 2000AD
 - iii. Town after 2000AD

Table 2: Establishment of prominent Social, Cultural and Religious Institutions in Amarkantak

Institution	Year	Institution	Year
Before 1900 AD		1980 AD-2000 AD	
Falhari Ashram	1890	Gopal Ashram	1984
1900 AD -1947 AD		HUDCO Colony	1984
Gurudwara	1929	Holiday homes	1996
Katara Dharmshala	1935	NavodayaVidyalaya	1992-93
Boundary wall of Narmada temple	1939	Police Station	1992-93
		Sarswati Shishu Mandir	1992

Institution	Year	Institution	Year
Before 1900 AD		1980 AD-2000 AD	
		Post Office	1993
1947 AD -1980 AD		Bus Stop	1994
PWD rest house	1954	Nagar Panchayat	1995
Electric Power station	1952	Shree Digamber Jain Temple	From 1998..
Forest Office	1964	Kalyanika Public School	1999
Branch of State Bank of India	1964		
Ram Bai Dharamshala	1956	After 2000 AD	
Govt.Higher Secondary School	1956	BSNL exchange	21 Jan 2000
Shanti Kuti	1968	Saraswati Higher Secondary School	2007-08
Barfani Ashram	1968	Mritunjay Ashram	2005
Raj Rajeshwari Temple	1973	IGN Tribal University	2008
Shankaracharya Ashram	1973	Kalyanika B. Ed. College	2014
Kalyan Seva Ashram	1978	Chandracharya Shopping complex	2016
Ram Krishan Kutir	1979	Bus Stand Shopping complex	2015
		New building of the Gurudwara	2013

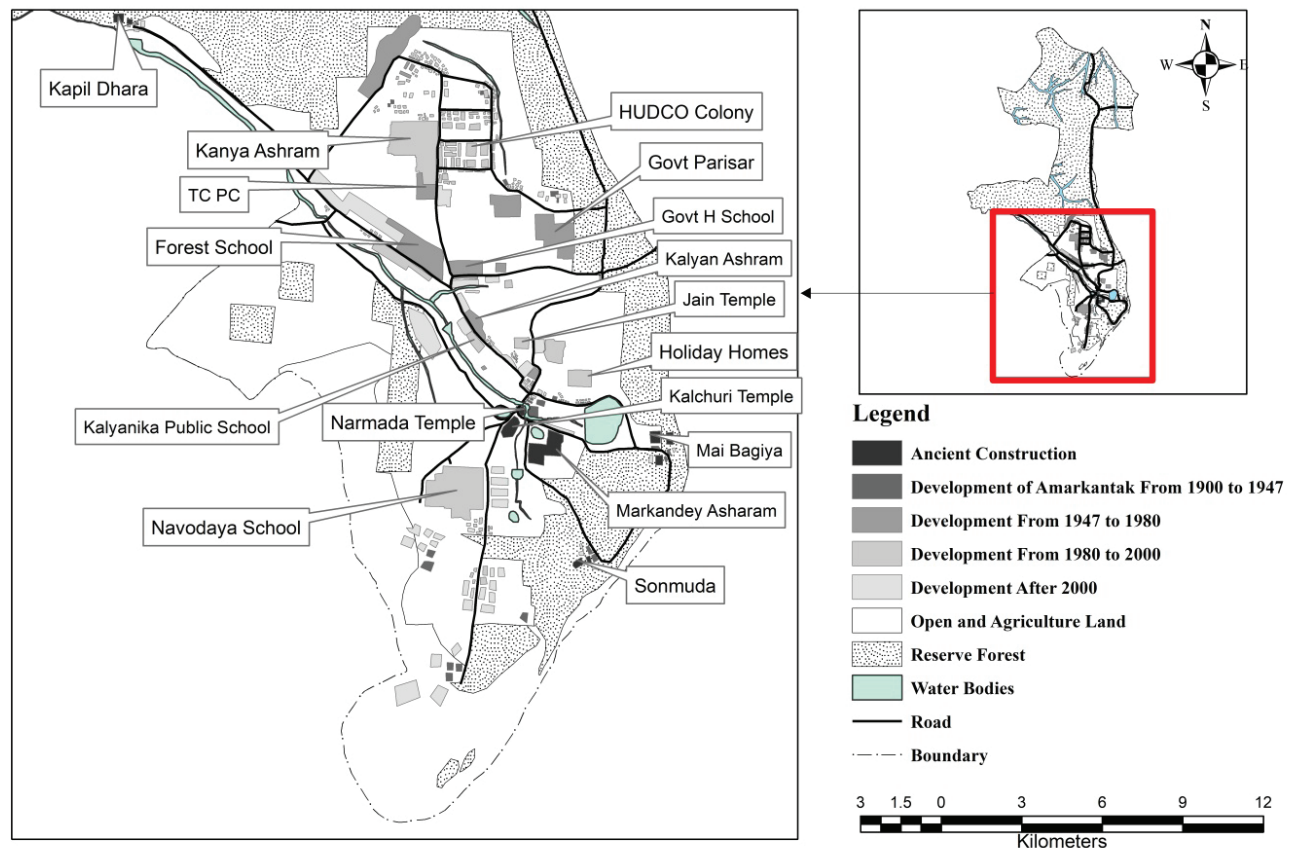
Source: Personal Field study, March-April, 2019

1. Town before 1900 AD

Ancient constructions are the oldest structures that took place a thousand of years back. The Kalchuri temples are constructed at Amarkantak in old architectural style with *mandpam*. These temples are prominent features which are constructed by Kalchuri King Karandev in 1042 AD while the Pataleshwar temple was founded by the Shankaracharya in 788 AD. The next oldest construction is Narmada temple. The rulers of the area paid attention towards Amarkantak as strategic and religious point of view. The importance of the place is mentioned in various old texts like *puranas* and other religious books.

There is a myth about the river Narmada and construction of the temple that Rewa Nayak, the dweller of the area has seen a dream, Goddess Narmada came in his dream and told him clean the cluster of bamboos of the small water body (present Narmada kund) and make temple here. Thus, the temple initially was constructed by Rewa Nayak and gained its importance among the saints, scholars and devotees. Thus, the place became a sacred place and attracted people from different parts of the country with the spreading its religious importance as well as the availability of medicinal plants. Amarkantak was on the way that connects India from north to south and the east in medieval period. The town was a center for worship and spiritual power in ancient time. The residential area of *prohits* has grown properly close to Narmada temple with the construction of houses.

Amarkantak Town: Histogenetic Evolution and Growth



Source: Based on Amarkantak City Development plan, 2011 and Field survey, March-April, 2019.

2. Growth of the town from 1900 to 1947

The area in the vicinity of Narmada temple was expanded with the construction of boundary wall in open vast land. The actual development of Amarkantak has started during the rule of Gulab Singh of Rewa state. He has constructed the boundary wall of the Narmada temple in 1939. The place became famous pilgrimage in central India and those who travel four chief pilgrimages (*charondham*) of India also come Amarkantak. Every ashram has its *dharamshala* for the cheap accommodation of pilgrimage people. During this phase Katare *dharamshala* has established in 1935.

The settlement has grown in this period from its old limits with the increasing population and development of connections with various places in the area as well as different small settlements in its periphery. The locality of present market area came into existence in this phase with the construction of a few houses. More houses were built later. The outer limit of core settlement was not changed in this phase of development. That is why, the rate of growth remained very slow.

3. Growth and Development of Amarkantak after Independence

“Urban growth is a spatial and demographic process that refers to increase importance of towns and cities as a concentration of population within a particular economy and society” (Bharti and Sharma 2014, p. 27). “The development of most urban areas is influenced, to some degree, by the processes

of urban policy and urban planning” (Pacione, 2009, p.164). After the independence of India, the growth of Amarkantak has rapidly changed. Various types of buildings are constructed in this phase of development. “The land changes, commonly referred to as urban sprawl, associated with rapid expansion of low-density suburbs into formerly rural areas and creation of exurbs, urban or suburban areas buffered from others by undeveloped land, have ramifications for the environmental and socioeconomic sustainability of communities” (Yuan et al. 2005, p. 317). The land of Amarkantak has rapidly changed into built-up environment with the construction of ashrams and other buildings due to religious importance and mining activities. The concentration of population has increased along the road from Narmada temple to *Vaitarni* (Naka). It was the time of benchmark development of the town. Many urban facilities have come up that led by two mining companies such electric power station, post office, banking branch, petrol pump, PWD rest house and educational institutions, etc.

Another most important development of Amarkantak is associated with the mining activities which came into being in this phase of urban development. Mining activities have impact on the settlement in multifarious ways due to rapid constructions, increase in the size of population and establishment of economic institutions. Many residential areas have grown nearby the mining sites of BALCO and HINDALCO along with Barati and Bandha *mohallas*. The mining activities have not only created employment but also led to establishment of many urban facilities such as educational and health institutions, road, electricity and tap water supply. Thus, small Amarkantak settlement gained its characteristics of town with the increase of population and urban infrastructure.

- (i) **Town from 1947AD to 1980AD%:** This phase of settlement development is marked by rapid growth with the arrival of public works department (1954), electric power supply station (1952), and office of the forest department as well as the opening of HINDALCO (1960) and BALCO (1962) mines at Amarkantak. These activities played their role as catalyst that attracts commercial activities and financial institutions. Therefore, a branch of State Bank of India (1964) and Govt. Higher Secondary School (1956) were established in Amarkantak. Both institutions became a place of attraction and residential areas came into being. Teacher’s colony was built in front of the school while bank *tola* is not a colony for employees, but tribal people erected their huts and later on other houses are also constructed here apart from it ashram and *aganwadi* centre were constructed in these localities.

This phase of development is marked as the constructions of hermitages in Amarkantak. Many religious trusts came into existence and acquired vast lands along the main road of Amarkantak for the constructions of ashrams namely Ram Bai Dharmashala (1956), Barfani hermitage (1968), Raj Rajeshwari Temple (Shankaracharya Ashram) (1973), Kalyan Seva Ashram trust (1978). The ashrams are the highly culturo-religious as well as political influential features in the area. The saints of Barfani ashram offers Yoga education which attracts foreigners also. These ashrams are also the partial source of employment to the local people. The management of such ashrams have developed their own facilities such as worship place, living space (rooms), water supply while the electricity connections got from the government supply. People are attracted to perform religious rituals and prayers. The workers are engaged in the preparation of food for saints and the executive staffs. Thus, many people either erected their huts or built houses to settle nearby the ashrams.

Clustering of houses in small pockets was an emerging feature during this phase of urban development. Many more localities came into existence namely, Bank *Tola*, Kapila *Sangam*,

Jamun *Dadar* and Tikri *Tola*. These localities are basically inhabited by the labourers and service class people. Formerly, they engaged in the loading and unloading the bauxite in trucks. At present, they do work as sweepers, and daily wage earners.

The peripheral open spaces have occupied by the migrated people as they have built their huts/houses and *bari* (farm). Many people are attracted to settle in Barati, Hindalco, Balco and Bandha localities during mining activities. People of these localities depend on the mines for their livelihood. The roads were constructed to connect all these sprinkled localities. Many shops of required items/goods are opened at Amarkantak that enlarged the business activities. The periodical market is started at Amarkantak during this phase.

(ii) Town from 1980 AD to 2000 AD

Many Government and private institutions were established in this phase of development and expansion of the town such as Police station and its residential colony, Navodaya Vidyalaya (1992-93), Holiday Homes (1996), HUDCO colony (1984), bus stop (1994), post office (1993), Kalyanika Public School (1999) and the Gopal Ashram (1984).

The economic activities have increased in this phase of development with the increase of population due to immigration of people from surrounding region as well as different parts of the country. The bus stop of Amarkantak is shifted at *Naka*. The HUDCO was constructed a residential colony at Barati for public but failed to accommodate people as below standard building materials and were prone to damage. The government has also constructed PWD rest house and Holiday Homes to accommodate the government officials during their visit. Kalyanika Public School setup by Kalyan Seva Ashram Trust to provide standard education to the students.

(iii) Town after 2000 AD

This phase of town development is marked as the filling of patches rapidly with the establishment of commercial shops, academic institutions, cultural institutions, facilities as well as residential quarters. Many shopping centres are developed by the local area administration or private. People have constructed more residential houses in Amarkantak especially in Barati area with the increase of population. Economic functions and services are obviously increased in Amarkantak with the increase of demand of the population as well as commuters. “Contemporaneous city formation and size determination involve a trade-off within cities between the benefits and costs of the changing city size” (Black and Henderson, 1999). Thus, much open space of the town is developed, and town became denser with structural changes.

The major constructions took place in the town namely Mrityunjai Ashram (2005), Saraswati Higher Secondary School (2007-08), PDS shop at Barati (2013), LPG House (Indane) (2014), Vetnary Hospital (2014), Bus stand shopping complex (2015), Chandracharya shopping complex (2016), and the Maikal Park. The establishments of higher education institutes such as Indira Gandhi National Tribal University, Amarkantak (2008), Kalyanika B.Ed. College at Chandracharya hospital campus (2014), and the Regional campus of Makhan Lal Chaturvedi University (2015). Thus, this phase is recognized as the establishment of higher educational institutions in Amarkantak. “The future development of the city depends on how its rich cultural heritage is understood” (Sharma and Tiwary, 2008). At Present, Barati locality is most preferential area for construction of houses for personal use and rent purpose after establishment

of University. Its topography and availability of open and private land are main cause of its attraction. The Jamuna *dadar* is also developed as residential houses of poor people which is initiated by local body governance to allot the land to the people. Many people are shifted from the locality close to Narmada temple.

Concluding Remarks

The evolution of the town is having long history which is mentioned in many old texts. The growth of the town is very lopsided during the functioning of mining companies. The town has emerged close to Narmada temple while the present scenario of the town shows that the grouping of residential areas at different parts of the town and the various patches are filled and these scattered localities came into closer to each other. Flores *et al.* (2004) has studied that “the location of new residential development is influenced by preferences for lower density areas that nonetheless are close to existing urban development”. Different nuclei of the town attracted people of a particular group to settle there. People preferred to live at the places as per the nature of work and the availability of space. The constructions of connecting roads, hermitages, commercial outlets and other institutional and administrative set ups filled the spatial gaps between residential areas. The constructions in central part of the town are also controlled by the restrictions of the government as the holy place. The construction of Narmada temple and the ancient group of temples played a crucial role in the establishment of hindu culture which attracted the residential houses also. Other nuclei came into being namely HINDALCO, HUDCO, TCPC, Govt. higher secondary school, Navodayavidyalaya, SECL guest house, Kapila river confluence, Holiday homes, Digamber Jain temple, etc. which attracted people to constructed residential houses in their nearby areas.

Hermitage culture is very much flourished in Amarkantak with the gaining its importance as pilgrimage since long back which affected the distribution and grouping of residential houses and many other functions of the town. Thus, urban build landscape shaped according to the ashrams, other structures and topographic features. The place is developed as a centre of education and learning.

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Innovation by Women and Innovation for Women – Deciphering the Link for the Indian Patent Regime

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Abstract — While the persistence of wide gender gap in patenting and STEM is a widely known fact, what is less explored is how that gap affects the nature of innovation. Several previous pieces of literature have explored the same, and have concluded that the persisting gender gap in patenting and STEM is detrimental not only to the women’s careers but also to the society since it paves the way for a biased innovation scenario. This paper attempts to further explore the link in the Indian context by following a mixture of empirical and doctrinal research methodologies. A content analysis of the Indian Patent Office’s journals of 2019 was done to get an idea on the number of patent applications focusing on women-specific issues, and that number has been contrasted with the number of women inventors. In the later part, the paper advocates that since closing the gender gap is necessary, the Patent laws should be relooked from a feminist lens with urgency.

Keywords: *Women in Patent, Patent and Gender, Indian Patent Law, Innovation for women.*

The wide and persisting gender gap when it comes to patenting activities is not a lesser-known fact anymore, and so is the gender gap in the STEM fields (Science, Technology, Engineering, and Mathematics). While scholars disagree when it comes to the sequencing of these two, with some scholars arguing that gender gap in STEM is the cause for the gender gap in patenting activities and some other scholars arguing these two to be relatively independent phenomenon, there is a consensus regarding the existence of these two gaps. The gender gap in patenting activities is persistent across the globe, although differences are observed when it comes to various national jurisdictions (Hunt et al., 2013).

The consequences of such a gap are far-reaching and development-obstructing. While the gap is of significant concern from the viewpoint of the female scientists and their career trajectories, there are far more significant socio-economic and cultural losses that the society incurs due to the persistence of such a gap. The economic weakening of the females as a whole is one such dire threat that this gap poses. As a study confirms, females spend around ninety cents of every additional dollar of income received for their families, and the health, nutrition and education of the family members which is only thirty to forty percent for males – confirming the positive relationship between economic empowerment of females and wellbeing of families and communities as a whole (VanderBrug, 2019). Some studies also have confirmed the significance of women participation for national economic growth and GDP,

stating that gender gaps in innovation represent lost potential and incurring of losses of up to thirty per cent of GDP per capita (International Labour Organisation [ILO], 2014).

In addition to these economic losses outlined above, the gender gap in patenting also makes the society incur certain socio-cultural losses which need mention. Lack of women participation paves the way for lack of women-centred designs and innovations. The psychological and biological differences in men and women make them focus their innovation on different aspects of life, resulting in a different spectrum of innovations up to some extent. Existing works have discussed this and shown that patents obtained by women inventors often tends to focus on reproductive technologies and technologies related to children and home (MacDonald, 1992; Sweet, 2000). What follows from that is if women and men tend to innovate in different fields, then a gender gap in innovation essentially means a corresponding gap in the innovation scenario and the types of innovations that are produced (Rosser, 2009).

This takes us to the focus of our discussion – the link between ‘innovation by women’ and ‘innovation for women’. ‘Innovation by women’, as discussed above, is strongly linked with ‘innovation for women’, and gaps and biases in one lead to corresponding gaps and biases in the other. While the gap in the former, that is ‘innovation by women’, is much discussed on, the gap in the latter, i.e. ‘innovation for women’ is often ignored – and that forms the focus of the discussion of this paper. The paper starts with a statistical analysis of the innovation gap in India in 2019, from 1 Jan 2019 to 31 Dec 2019, and then tries to find various interpretations thereof. In the later part, the paper discusses the range of possible solutions to the gap.

Women-centred Innovation in India – An Analysis

In analysing the share of women-centred innovation in India, the researcher referred to the Indian Patent Office’s journal, which publishes the patent applications received by the office. Applications received between 1 Jan 2019 and 31 Dec 2019 were considered, out of which applications specifying women-centred inventions were counted. To ascertain which of the applications pertain to women-centred inventions, the abstract of all the applications were referred to, and abstracts containing phrases “women”, “woman”, “female”, or “females” were shortlisted. Out of the shortlisted abstracts, those who generically used the abovementioned phrases like ‘men and women’, or ‘male and female’, or with some other meanings like ‘female circuit point’ et cetera were removed to make the final list of applications which contained women-centred inventions.

‘Women-centred inventions’ included inventions that focus or revolve around women’s lives or needs. Examples of inventions which found mention in our women-centred inventions list are kitchen equipment, menstrual devices, pregnancy-related inventions, inventions focusing specifically on women’s health and hormonal needs, child delivery related inventions, female safety inventions, female employment inventions, breastfeeding and lactation related inventions, inventions specific to the needs of working mothers et cetera.

Fifty-two weekly patent journals were reviewed (Office of the Controller General of Patents, Designs & Trademarks, 2019), and on an average, the number of applications focusing on such women-centred inventions were somewhat between 0 to 3, with 0 and 2 being the most common numbers. On a total, over 52 weeks, that is from 1 Jan 2019 to 31 Dec 2019, there were only 79 total patent applications were filed which focused on women-centred inventions. The researcher filed an RTI query with the Patent office to find out the total number of patent applications filed in that period, which was

revealed to be 53627 (fifty-three thousand six hundred twenty-seven) applications. What follows, only 0.14% of the total patent applications filed were relating to women-centred inventions.

The researchers also wished to find out the number of women patent applicants to establish the link better. However, such gender-specific data could not be found out anywhere on the official publications of the patent office. Responding to an RTI query by the researcher, the patent office stated that it does not maintain such data on record. The reason for the same, however, the patent office declined to answer. The researcher hence referred to two other studies to get an idea of the required figures. First, it looked at a study conducted by Obhan & Associates in 2018 (Obhan & Associates, 2018). The researchers, in that project, went through the patent journal and tried to identify the gender of the inventors by their first names. The researchers referred only a single patent journal, that published on 20 Apr 2018, and found out that only 152 were by women inventors out of the total 2956 applications – translating to around 5.14% women participation. There is another source claiming that India had 0.5% women participation in patenting in 2014, although the source is not cited and hence does not seem to be trustworthy (Krishna, 2016).

The second study referred by the researcher was the WIPO statistics database for PCT applications (World Intellectual Property Organisation, 2019). For 2018-2019, the total PCT applications filed by Indians were 1442 (One thousand four hundred forty-two only) out of which only 29 (twenty-nine) applications were filed by at least one women listed as inventors – which translates to 2 (two) percent women participation. Although this data is not of same nature, since the previous data we dealt with were about national patent applications and this one is about international applications filed with PCT; still, we thought of discussing this since this reflects a low enough participation of women in patenting which persists to be around 1 to 2 per cent – close enough to reflect the percentage we found for women-centred inventions.

Decoding the data obtained, we can conclude that there seems to be a direct link between the low participation of women in patenting and related activities, and the small number of inventions focusing specifically on women-centred issues. This is detrimental to society in at least two ways. Firstly, it makes the innovation scenario biased, and hence hinders the culture of pluralism in innovation. Such a trend spells devastation in the days to come for the upcoming generations of innovators specifically and society generally. Secondly, it further isolates the females from the socio-economic mainstream by denying them the advantage of innovation and technology – making gender discrimination multi-fold and more profound.

The Way Forward – A Feminist Approach to Innovation?

Considering the above data and the following discussions, the solution that comes first to our mind is why not encourage women to patent more, then? Why not devise specific schemes for them, and make provisions for awards and other incentives to make more and more women interested in patenting? Talking of such solutions, in India, women patent applicants have to pay the lowest fee among all categories of applicants; the facility of expedited examination can be availed by women applicant (Patent (Amendment) Rules, 2019); IPR awareness programmes are conducted regularly and widely with active participation and sponsorship from the India Patent Office itself; CGPDITM provides part of funds to conduct awareness programmes by many industrial organisations, such as CWEI (Consortium of Women Entrepreneurs), CII, FICCI, Assocham et cetera – and still India has only 0.14% of its innovations focusing on women-specific issues.

This brings us to the apprehension that maybe encouraging women to patent more is not the solution at all (Melo-Martín, 2013). While some studies have concluded that women innovate less because of factors like insufficient access to capital and the lack of personal connection with potential sources, lack of basic education and support networks, both social and technical (Chatterjee & Ramu, 2018), or even lack of access to information and communication technologies, above discussions make us question the depth of such conclusions.

As some of the previous literature state (Melo-Martín, 2013), behind such a claim that encouraging women to patent more is the solution, lies at least two problematic assumptions. The first is the assumption that the methods to determine women's productivity in patenting activities are an appropriate way to measure research quality, research effort, and research impact. The second is that patenting, particularly in academia, benefits society as a whole. However, as de Melo-Martin discusses in *Patenting and the Gender gap*(Melo-Martín, 2013), patenting in more quantities may not be the right solution. Instead, the solution may lie in rethinking our measurement standards that are far from being gender-neutral. Measurement and regulatory standards, as feminist scholars have pointed out (Burk, 2011), are most often than not favouring for the male inventors – measurement standards, laws, and regulations that favour both the sexes equally can go a long way as a solution.

A Gendered Patent Law?

Before striving for gender-neutral patent law, one question that arises naturally is that is the patent law gendered, in the first place? How can a law have a gender (Burk, 2011)? Burk provides an answer beautifully: a gendered law is one which is, first, explicitly directed at promoting some gender-based social roles, and second, subtly incorporating into their structure such gendered presumptions or conceptions that pave the way for stereotyped legal views (Burk, 2011).

One of the problematic areas where scholars have pointed fingers is the notion of objectivity in law generally, and in patent law, particularly in the form of the PHOSITA standard. The PHOSITA standard, which translates into the Person Having Ordinary Skill In The Art, has been a de facto standard for non-obviousness across the globe – and feminist scholars believe that this is where the problem lies. The PHOSITA standard, and the Winslow tableau test, envision the PHOSITA through an unrealistic standard, for one, and through the lens of neutrality, detachment, and impartiality, for the other. Looking through the lens of neutrality, detachment, and impartiality is hindering for women inventors to pass through since these values of detachment do not quite resonate with the feminine. An example can be taken of the reasonability standard in Tort law, where a reasonably prudent person is expected to be insensitive and secluded, instead of connected and sympathetic; right-conscious, instead of responsible.

By such an approach, we are excluding a particular type of knowledge from our innovation ecosystem altogether. Maybe we are consciously excluding it because it is not useful; but, also, maybe it is useful in a way that our cultural stereotypes have taught us to ignore – and such a case of knowledge exclusion is not only unfair but also devastating. Moreover, if our goal is to build a patent regime that encourages innovation in addition to social justice and equality, not only the PHOSITA standard but also the whole patent system and patentability criteria must be reconsidered. Other things to be reconsidered are the patentability criteria and the patent protection duration.

Talking of the Indian scenario, the inventive step assessment in India is four-stepped. First of all, there needs to be a novelty, and then there needs to be non-obviousness or inventiveness, third

comes the requirement for industrial applicability, and last comes patentable subject matter under sections 3 and 4 of the Indian Patent Act, 1970. While novelty and industrial applicability are not such problematic fields, what raises concern often is the field of inventiveness or non-obviousness. Section 2(1)(ja) of the Patent Act defines inventive step as an invention that involves technical advancement, or has some economic significance – and in addition to this, the invention must not be obvious to a person skilled in the art.

Examination now must be done of the meaning assigned to the phrase ‘Person skilled in the art’, and whether it has the same gender biases as contained by the PHOSITA standard. A person skilled in the art, as the Indian courts have deciphered it, is a bit more flexible and accommodating than the PHOSITA standard (*Dickinson v. Controller General of Patents, 2012; Ajanta Pharma v. Allergen, 2013*). A person skilled in the art is a hypothetical person who is presumed to know all the prior art till date, both patented and non-patented knowledge that is available to the public. The Intellectual Property Appellate Board, in *Enercon v. Dr. Aloys Wobben*(2013) observes that it does not intend to visualise a person who has super skills, but at the same time, it does not want to make this person skilled in the art to be incapable of anything but carrying out basic instructions only.

In *Bishwanath Prasad* (1982) case, the Supreme Court focused intensively on the interpretation of inventive step, and observed that invention should be more than a mere workshop improvement. However, what must be considered is, does innovation that does not fulfil criteria of invention fall under the category of ‘mere workshop improvement’? The difference between invention and innovation is a matter of an upcoming environmental jurisprudence, with the invention being interpreted in its traditional meaning, and innovation being interpreted as workshop improvements of the existing technologies which result in an environment friendly process or product. The Supreme Court, however, made way for such an interpretation by stating in *Bishwanath Prasad*(1982)that an invention may be patentable if it is substantially ‘cheaper’ or ‘better’, leaving open the interpretation of the term ‘better’.

Conclusion

With the recognition of the abovementioned issues, we shall proceed to think of some of the possible solutions. To make the PHOSITA standard more accommodating of the feminine viewpoint, a reciprocal PHOSITA can be visualised that makes way for the connected, communally engaged, responsible, and epistemologically situated person as opposed to the current perception of a detached, isolated, neutral, and insensitive person (Burk, 2011). Such a reciprocal PHOSITA will not only be more women-specific but also be more accommodating for all the other innovation-marginalised areas ensuring more inclusivity in innovation. This also may make way for specific not-so-rational knowledge like that of ‘Jumping Genes’ of Barbara McClintock.

Also, recognising the concept of a communally engaged PHOSITA may make way for more instances of joint inventorship – which would make way for more women in patent since most cases of patenting currently includes women in supporting roles only and not as co-inventors (Whittington & Smith-Doerr, 2018). Under current law, an inventor must have invented at least one claim – persons otherwise contributing, like reducing the idea to execution or giving rise to an idea, are not considered inventors, the most classic example being that of the FIV in the case of *Brown v. Regents of University of California*.

This study concludes that a feminist approach to the existing patent law, among other things, is necessary not only to foster the growth of women participation in patenting activities and women-

centred innovations but also to make way for the innovation scenario to be more inclusive towards areas that have been historically innovation-marginalised. Such a step would do a great favour both for innovation economy and social justice. What makes a viewpoint particularly feminist is that it is derived not from a dominant male perception of reality but a first-hand account of female experience (Cain, 1988). Talking about a legal system that does not encompass specific categories of viewpoints and it unresponsive to specifically female concerns, among other things, the completeness of such jurisprudence is bound to be questioned at some point or the other (Scales, 1981; MacKinnon et al., 1985).

Annexure I

Number of Women-centred patent applications from 1 Jan 2019 to 31 Dec 2019

Patent Journal No.	Part	Number of Mentions	Details (Separated by comma)
1	1	0	
	2	2	Women safety, Menstrual Device
2	1	1	Household Cleaning Device
	2	0	
3	1	0	
	2	3	Determination of atrial potential of females, Women safety, Kitchen safety,
4	1	3	Women health, Women safety, Female reproductive health
	2	0	
5	1	2	Urine Testing, Child delivery prediction,
	2	0	
6	1	0	
	2	0	
7	1	0	
	2	0	
8	1	0	
	2	0	
9	1	2	Women safety, Reproductive Health,
	2	3	Child delivery prediction, Pregnancy Risk, Women safety,
10	1	0	
	2	1	Kitchen equipment,
11	1	0	
	2	0	
12	1	2	Female Clothing, Women Health,
	2	0	
13	1	2	Female safety, Women safety
	2	0	
14	1	0	

Patent Journal No.	Part	Number of Mentions	Details (Separated by comma)
	2	0	
15	1	0	
	2	0	
16	1	0	
	2	0	
17	1	0	
	2	0	
18	1	0	
	2	0	
19	1	3	Female health, Women safety, Kitchen
	2	0	
20	1	2	Women security, women security
	2	0	
21	1	2	Menstrual hygiene, female clothing,
	2	1	Breast cancer
22	1	2	Women health, women health
	2	2	Female hygiene, Reproductive health
23	1	0	
	2	0	
24	1	1	Female health,
	2	0	
25	1	1	Women employment,
	2	0	
	3	0	
26	1	0	
	2	0	
27	1	1	Female sexual health,
	2	1	Women clothing
	3	0	
28	1	1	Female health
	2	0	
	3	0	
29	1	1	Women reproductive health
	2	1	Female sexual health,
	3	0	
30	1	1	Female reproductive health,
	2	0	
	3	0	

Patent Journal No.	Part	Number of Mentions	Details (Separated by comma)
31	1	0	
	2	0	
	3	0	
32	1	2	Female safety, women health
	2	0	
	3	3	Female health, female health, breastfeeding
	4	0	
33	1	1	Women safety
	2	0	
34	1	0	
	2	0	
	3	0	
	4	0	
	5	0	
	6	0	
35	1	3	Female managers competency, women health, women hygiene
	2	0	
	3	0	
36	1	0	
	2	0	
	3	1	Female health,
	4	0	
37	1	2	Female medicine, female medicine
	2	0	
	3	0	
38	1	0	
	2	0	
	3	0	
39	1	2	Female convenience, female health
	2	1	Women reproductive health
	3	0	
40	1	1	Pregnancy
	2	0	
	3	0	
41	1	1	Women nutrition
	2	1	Driving women
	3	0	
42	1	2	Female health, women hygiene

Patent Journal No.	Part	Number of Mentions	Details (Separated by comma)
	2	0	
	3	0	
43	1	1	Lactating women
	2	0	
	3	0	
44	1	1	Female Safety
	2	1	Female Safety
	3	0	
45	1	0	
	2	0	
	3	0	
46	1	0	
	2	0	
	3	0	
47	1	1	Female convenience
	2	3	Women safety, Female Contraception, Female Contraception
	3	0	
48	1	1	Female Health
	2	0	
	3	0	
49	1	1	Brain Gender Identification
	2	1	Personalised Contraceptions
	3	0	
	4	0	
50	1	0	
	2	0	
	3	1	Female safety/safety in general
	4	1	Breastfeeding
	5	0	
51	1	1	Pregnancy
	2	1	Menstruation
	3	1	Women health
	4	0	
52	1	3	Women safety, Pregnancy, Female Hygiene
	2	0	
Total		79	

Annexure II

Copy of RTI Response received from the Indian Patent Office

Final Status of CGPDT/R/E/20/00095

Applicant Name Anshuman Sahoo

Date of receipt 10/05/2020

Request Filed With Office of the Controller General of Patents, Designs & Trade Marks

Text of Application

1. How many patent applications were filed from India in the year 2019, that is, from 1 Jan 2019 to 31 Dec 2019.
2. Of them, how many inventions had at least one women as an inventor.
3. Does the Indian Patent Office record the gender of applicants.
4. What steps are taken to encourage more patent filings by women inventors. How does such benefits reach the inventors if the gender of the applicant is not recorded.

Request document (if any) document not provided

Status REQUEST DISPOSED OF as on 14/05/2020

Date of Action 14/05/2020

Remarks

Reply :- with respect to your RTI application the following is stated para-wise:

1. 53627
2. No such data in a compiled format is maintained by this office.
3. No.
4. Women applicants are treated at par with Natural Person (NP) for filing of patent application and as such they have to pay the lowest fees among all categories of applicants. Further, the facility of Expedited Examination can be availed by woman applicant, if such application is made by a woman applicant(s) alone or jointly with one or more NPs. You may please refer

Patents(Amendment)Rules,2019(http://www.ipindia.nic.in/writereaddata/Portal/Images/pdf/patents_amendment_rules_2019.pdf). IPR awareness programmes are conducted by several organisations in the country where officers of India Patent Office (IPO) participate as resource persons and in these programmes many participants are women. Further, O/o CGPDTM provides part of funds to conduct awareness programmes by many industrial organisations, such as CWEI (Consortium of Women Entrepreneurs), CII, FICCI, ASSOCHAM, involving women participants.

The second part of the query pertains to seeking explanation instead of information and therefore is beyond the purview of the Section 2(f) of the RTI Act, 2005. However, you are informed that several awareness programmes are conducted by Patent Office particularly in educational institutes wherein these benefits available to women applicants are given wide.

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Gender Equality in India: Ideas of Vivekananda

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Abstract — Vivekananda is the prominent thinker of India, not only a thinker but also known by a monk, teacher, leader, mystic, philosopher also. Education for youth is the main thought of him, but with this, he always stressed upon the dignity, identity, equality of the entire individual. In all dynamics of society individual participation is the main subject and that could be possible only when equality will prevail and character formation would develop. Development is the ultimate goal of any nation and that could be achieved through the gender equality. Gender is the cultural construction of society and sex is the biological concept but both the meaning of ‘sex’ and ‘gender’ interchanged by people which would lead to misunderstood and for this equality cannot properly be explained. According to Vivekananda “There is no chance for the welfare of the world unless the condition of women is improved. It is not possible for a bird to fly on only one wing” which denoted the one side of development but full development cannot be met by this. India’s patriarchy use to dominate women pertain to their education, health, employment, these three basic parameters will be analyzed in this paper and also give a proper example with reference to India. In addition to this, thoughts of Vivekananda would mitigate the proper channel to gender equality which will strengthen the society like India. Vivekananda always supported girls to educate themselves on Japa, yoga, meditation, moral development, worship and also religion and science; with this support, they will enjoy their equal rights with the men. He fought for women and gave them a proper platform to enhance their personality and character. He focused on the full development of the individual.

Keywords: *Education, Health, Moral Development.*

Introduction

Swami Vivekananda is the real hero of India. He is emancipated with new ideas and thoughts which makes him different from other social thinkers. He is the developer and maker of the personality of an individual. His real name is Narendranath Dutta and he was a sanyasi from a very young age, who wanted to gain knowledge which could make the world towards a betterment. He is the one, who stressed upon the overall development of the individual whether it is male or female, also he is considered as the national leader to motivate youth in terms of education, health and the opportunity to build themselves for the reconstruction of society.

Objective

This paper is going to analyse the basic ideas of Vivekananda towards the stable gender equality through the basic necessities of individual. The basic needs are the essential for any human being to live a normal life so Vivekananda stressed upon this necessity.

Methodology

The methods of this study fully depend upon the secondary sources of research and completely reviewed by the plethora of literature. In the descriptive and explanatory method, the paper will be helpful to know about the gender parity in India.

Review of Literature

Singh (2014) Education is the key factor in which all the individual can reach to their goals. Although the expansion of the education is so broad but some lacking points which down the impact of education. According to Vivekananda, India is not regulating the workers properly for the growth of state. On this way women education is also that much important as men's education. Vivekananda always try to stress on the proper education and right education for women and men. There are many schemes such as Mahila Samakhya Programme, Kasturba Gandhi Balika Vidyalaya Scheme has been organized to promote the right education for the underprivileged girls, but current Scenario not upheld to the mark which Swamiji explain about education.

Nandy and Kumar (2014) As per the view Vivekananda "The best thermometer to the progress of a nation is its treatment of its women". Entrepreneurship is the booster for the successful economy for the state. And women entrepreneurs are not only develop women but also create their identity. If family can be run by women then why not state. The Government of India said about the women entrepreneurship financial interest which was 15% of the capital. Not only this Centre for Women's Business Research 2009 it was mentioned that women in the sector of entrepreneurship twice fast as compare to other business. There are many obstacles and hurdles for women empowerment and the main reason behind is the gender bias and men centric business always stressed upon the men capability and their recognition.

Banerjee and Meeta (2015) Swamiji was a social reformer and UNESCO declared him as prominent educationist of the World. He points out the education's proper definition as VEDANTA the words 'Veda' (wisdom) and 'anta' (supreme) denoted the "Supreme Wisdom". The knowledge should be pure, spiritual, he stressed upon the education for both men and women because both are the contributors of welfare for the state. Two type of Knowledge should be there: 1. Secular Knowledge is for economic development and 2. Spiritual Knowledge is for the faith within the person.

Concept of Gender Equality

Vivekananda is the prominent leader who supports gender equality and explained it in a new and contrasting way, such concept of gender equality is explained through the soul, soul has no sex and it cannot recognize between male and female (Manna, 2016) the cultural definition will promote the meaning of gender and sex is the biological concept so the meaning of 'gender' and 'sex' are very much dissimilar, but people always interchange the meaning that becomes muddled. With the addition to this, the concept of gender and gender equality always in the controversial cause of this is lack of awareness and lack of knowledge, which Vivekananda always talks about.

Vivekananda's View on Women in West and India

As per the views of Vivekananda, the women in India are very loving, caring and have the selfless love and respect towards their family. He declared women in the west are the form of womanhood rather than the motherhood of Indian women, Indian women know the chastity and the meaning of heritage while western thoughts are different from this (Manna, 2016) In western countries, women were very much self-dependent, decisive and developed but the respect and love which Indian women use to give that cannot be comparable.

History of Women

The women are the base of any nation and that should be respected, by pertaining this Swamiji always said the only cause for the deteriorating place of women is the lack of awareness about the magic of education, they are considered as the child producing machines, for instance, his own sister Yogendrabala who committed suicide only because inadequacy of awareness (Khatun and Ahmed, 2018) at that time the situation has planned by male domination, there is no such kind of rights, they are treated as an object of house. At the same time, they were suffering from many restrictions, the most important thing is that they had no right to get an education for themselves and that is strictly prohibited for them. Gender discrimination started from the ancient time, some of the reasons which are based upon the discrimination those are like early marriage, dowry, rape, harassment, molestation etc. these are some of the social evils which cannot be denied in terms of women subordination. Indian women are just like clay and they can be mold in any form and that men always tried to do and they mold them according to their wishes and do not give space to make themselves empowered. Because of the patriarchal society, women are considered as the top priority for men but in reality, they are just a burden for them. Besides men's social reformers, also women reformers are given their best to transform the society of India, and among them, Savitribai Phule is the one who always stressed upon the education of girls and expressed to enhance their capability towards themselves. The followers of Brmahavadinis Gargi, Maitri and Sanghmitra were also with Swamiji to elaborate on the world on the concept of love, education, and self-dependence (Khatun and Ahmad, 2018).

Vivekananda's View on Overall Development

A proper identity for an individual is based upon some basic necessities which are education, sound health, and employment, and it is the myth for people that only men need this but women are equally entailed these three things. As we all know the position of women in the age of Vivekananda, for this he always told about the concept for these three things which are morally and physically stabilize.

- (a) **Education and Vivekananda: "Educate your women first and leave them to themselves, then they will tell you what reformers are necessary for them."** Swamiji is very much against the way decisions are taking by their male partners, because as per his concern women are strong enough like men and they can make their own decisions. Education is the keystone for every human being, from the medieval period it is seen that women have used to given the household education and that is enough for them (Pandey and Singh, 2015) The cultures of any nation is the main source for education and India has many cultures such as Mahabharata, Ramayana, Gita, Vedas, and Upanishads and these have spiritual effect towards education which is the heritage of our Country. With Swamiji, Rabindranath Tagore, Gandhiji the top leaders also stressed upon the features of education which should be regulated all over the

country, some of them are, overall development of an individual, practicing brahmacharya, mental-physical power and imparted only positive education which will give the scope to know the real face of society. At the same time, religious education also contributes to the major part of education which should be flexible for anyone, the religion does not bound anybody but to give love and respect to all. (Mondal, 2015) He established a girls school with the help of first western women sannyasin Bhagini Nivedita, that school named as “Ramakrishna Sarada Mission Sister Nivedita Girls’ school” which is located in Badabazar in North Kolkata (Mondal, 2015) his main purpose is to derive gender equality among people through this education, to increase the capability, skill and enhancement among all the spheres. Boost up the mental, spiritual character is only through the right and positive education. Education is the process where all the young minds spark and both men and women are a companion to each other so both should grab the education in terms of every single sphere, whether it is the agricultural field, playground, home, workplace, etc. (Barman, 2016)

- (b) **Health and Vivekananda:** Swamiji is very much worried about the health of individuals, anxious more about the health of women because they are regularly taken it for granted with respect to women’s health. Since ancient times it has been seen that the mortality rate of women is very high due to lack of care, lack of food, early marriage and many more. It is explained by Swamiji that women are suffered from many evils, early marriage gives the burden of child which leads to the gynecological problems which face women badly, with addition to this, they are not taking food regularly, before husband or male member of family, girl children were not using to take proper mill that resulted to bad health and malnutrition. (Mitra, 2017) According to him, education of science is the mainstream to understand the concept of health. He focused upon the individual both men and women are the future of thenation and this can be possible with sound health, science, yoga and spiritual concept which are some of the phenomena recommended by him. Meditation for mental peace and love towards each other is the best thing that makes the human mind healthy. Yoga and meditation is the main theme which calms the mind and will make the right decisions. Indian spiritual power is the cornerstone that focuses on the health of people.
- (c) **Employment and Vivekananda:** As per the above discussion, health, education these two base of the individual when completed then employment is self-activating to both of them. Self-empowerment is only can achieve when both health and education will be given equally. In the respect women, it realized that during the period of Vivekananda, there is no education, no awareness has provided to women about their self-improvement, hence Swamiji always concerned and motivate them, one of example is that widow marriage is not preferred by him he used to say that women should be that much educated then they can take their decisions by their own in case of their personal matter, economical ground and other spheres also. Financial support will strengthen the position of the individual.

Conclusion: Execution of Ideas in Favourable and Unfavourable Ways

As an above discussion, it is clear that the three parameters are the main platforms of the individual which will give the fullest upliftment to both the gender, Swami Vivekananda always supports and recommends gender equality which is necessary for the growth of every nation. He is the observer of the human mind and their fundamental needs, the beauty of their idea is that freedom for women only can accomplish through the self facilitate and make yourself with more power with education,

self-motivation to do better in the economic sphere and solve your problems by yourself with full confidence. The thoughts of caste, kinship, marriage, family etc. are the obstacles to women's growth. (Sharma,2010) But if we consider recent period, time has been changed and Vivekananda's thoughts were somehow implemented, many reformations happened, earlier girl child had to do work in the home due to the burden of the family and gender discrimination has taken a greater role but today both the individual is working for themselves, for their family and for the society as well. Gender inequality at a certain point decreased with respect to love, care, devotion. Now the women lead the house and working outside as well as helping her husband and share the burden of their particular environment financially along with emotionally (Tomar,2011) it is the biggest tribute to Swamiji. Beyond this positive changes also there are many loopholes which society needs to understand, people need to know the real meaning of India, the cultural concept and the spiritual aspect which is ignored and focused on the western pattern of life which means both adopt westernization in terms of education, very much career-oriented but forget the moral values, disrespect towards their families, adopted nuclear family, don't believe in god, harm the health by having certain kinds of foods which are influenced by western countries, women made themselves as a commodity in digital media sector to enhance their ability and highly ambitious, hence it resulted in a position which imbalanced their life it is not about the only one gender but it is about men also, both of them influenced by this way which shapes them a human which is shaken by their mind and body. By this imbalance of life makes the society challenging which have been increasing and giving bad effects to both, such as rape cases increased, use of technology in an inappropriate way, science has brought every option which makes individual much inactive, both have no spirituality and faith of God, no one wants to learn household work, brotherhood is absent today, and supreme thing is that youth are misguided by such kind of education. Swami always followed think globally and implement locally as per the concern which suits the society. In every society, it is seen that if any evil or the challenge is carrying out it affects both the gender so equality and the right education would make the human being a better person.

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Inclusion of Traditional Knowledge into Formal Education System: An Analysis of National Education Policy, 2020

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Abstract — The Indian education sector is going through a significant transformation that will change its meaning entirely. Until now, the education sector was linked with the economic interests of the society or the individuals. With the New Education policy, all necessary aspects of human life will get specific consideration. These include financial, social, environmental, economic and cultural aspects. Now, learners will be encouraged to become responsible and well-being members of society by learning how to live a sustainable life in harmony with the environment. The New Education Policy of India promises to promote the lost value of traditional knowledge in future generations. In the present article, it is tried to study the initiatives which are taken by the Government through NEP to assimilate TK into the formal education system. Also, in the present article, unsuccessful and successful models of standard education frameworks are discussed that are adopted by other culturally rich nations. These models are examined to measure the Indian National Policy Education framework's strengths and weaknesses, protecting TK. Though NEP is an excellent step towards preserving and promoting Indian TK, some lessons from the contemporary world need to keep in mind while dealing with such delicate Indigenous Knowledge, which is a part of an umbrella word, Traditional Knowledge.

Keywords: *Indigenous Knowledge / Traditional knowledge, formal / informal education / non-formal education, sustainable development, multiculturalism, multilingualism*

Introduction

In simple words, Traditional Knowledge means the experience that has been transferred from one generation to the next generation. At the same time, indigenous knowledge is related to a particular geographical area or a specific culture. Our ancestors had evolved unique ways of sustainable living in coherence with the environment. This knowledge always had the importance to deal with the natural surroundings, not only in the past thousands of years ago, but it would have the same value even thousands of years later. This delicate balance that our ancestors had maintained to live sustainably needs proper protection and preservation. Here, while emphasizing preservation, we not just meant to keep those pieces of knowledge alive in books or museums, but rather forwarding them to future generations while enabling them to recognize its true worth. For such preservation, there is a need for a collaborated and concentrated effort at the global level. As of now, such collaboration has no

existence in the form of any treaty or pacts at the international platform. There are efforts at national levels through internal national policy systems adopted by culturally diversified nations. Countries such as South Africa, Namibia, Latin America, etc., have introduced some positive steps by making changes in their education policies in the early 2000s. Also, India is one of the fore-runners at WIPO, voicing to treat Traditional knowledge as one of Intellectual property, but it had not taken steps to conserve it through the route of its education system until 2015. India in 2015, adopted agenda for sustainable development goal 2030 and the global education development agenda reflected in the Goal 4 (SDG4), that “ensures inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030 (NEP, 2020). Better late than Never, in furtherance of such SDG Goals, India came up with National Education Policy 2020.

Why is the route of the education system so essential for protecting and preserving Traditional Knowledge? This query hits the human inquisitiveness at first stance. To answer the same, it is a well-established notion that education plays an essential part in forming one’s reasoning and ability to achieve the targeted goal. It also enables individuals to distinguish between right and wrong. Education doesn’t only mean to learn, but it also implies helping others learning to do things and encouraging them to understand what they gained and where they can implement their learning. In short, education provides society with a chance to make progress while fully attached to their roots. Knowledge can make the adult generation able to learn and understand traditional ways of practicing particular art, craft, scientific and technical activities. That will directly help TK preservation in the best ways. In the present article, what NEP has restored, which is essential for TK protection, is discussed. Here, the word “restored” is used because efforts to protect TK are not new to Indian Governance. Whether it is about introducing the People’s biodiversity Register or enacting a biodiversity act that includes protection for Plant varieties and Farmers’ right which is one of its kinds, India has proved its worth as one of the pioneers in protecting TK on many occasions. Such protection was never directed nor promoted with so much emphasis on the restoration of TK and cultural heritage. Preservation through the education system is the need for a country’s socio-economic and political development. Equality and Respect for TK holders are necessary to protect and preserve their knowledge and to improve the whole human race. For a race, which is trying hard to balance sustainable living with climate change issues? Such can be the impact of maintaining TK through the education system. How can such a strong statement be given? The UN System Task Team acknowledged the importance of indigenous knowledge for environmental sustainability and has stated: “traditional and indigenous knowledge, adaptation and coping strategies can be major assets for local response strategies”(UN task team, 2012).

Along with that, the use of Indigenous knowledge in combating the deteriorating condition of the planet and the potentiality of IK in its sustainable ways of living, in areas of conserving the environment, ecology, and biodiversity, conserving land and natural resources, and the management of wildlife, health, and education has been increased. (Agrawal, 2002). As it is a settled view, TK has tremendous scope of positively affecting human lives. It is not an exaggeration to say that preserving it through education is “the best way” for keeping it secure and safe.

Evidentially, the “UNESCO World Conference on Education for Sustainable Development” acknowledges that “Education is an institution that has several purposes. And, the development of human beings – not just any kind of human beings but thinking and caring citizens is one of high importance”(UNESCO, 2009). For that purpose of sustainable development of human beings, education

is an essential tool for preserving and protecting TK. For sustainable growth, principles of equity and mutual respect are imperative ways of creating a harmonious environment for non-indigenous people or technologically advanced generations and traditionally advanced older generations. These principles involve future generations who struggle to keep such ancient traditions and cultures safe in the era of the Internet of things. But there needs to be cautious when applying the education system in preserving TK/IK. It's been seen that the formal education system has harmed IK as there was emphasis on homogeneity rather than plurality. For example, "US, Canada, and Australia showed an incredible amount of indigenous knowledge loss from the beginning of the 20th century when the government of these countries sent indigenous children to residential schools, boarding schools or dormitories in an attempt to assimilate them within the mainstream society." (Ohmagari, and Berkes, 1997; Reyhner and Eder, 2015; Armitage, 1995). It is to be noted that the formal education system involves school/institutional education, subject-oriented education and certification/degree programs etc. So, for the meaningful inclusion of indigenous people in the education system, their unique requirements and circumstances are needed to keep in mind.

Furthering the above discussions, some existing models attempted to restore Indigenous Knowledge through the education system but failed in safeguarding their interest and led to adverse outcomes. In contrast, other models led to more successful results (UNESCO, 2016) fulfilling SDG4 in a real sense even before SDG coming into existence. For example, an unsuccessful initiative was taken by Australia for integrating Indigenous knowledge with the formal education system. On the other hand, with the implementation of intercultural bilingual education models, Latin America and the Caribbean have presented successful integration models.

"The creation of Indigenous universities along with other higher education institutes such as degree and master's programs to increase indigenous involvement have paved the way for a harmonious relationship between the two systems (western as well as indigenous)" (UNESCO, 2016). Mexico's multicultural universities have provided a place, to promote intercultural dialogue and train professionals interested in researching indigenous languages, cultures, and worldviews and committed to developing their communities. Such other initiative is the Alaska Rural Systematic initiative. "The main objective of the initiatives had been integrating indigenous knowledge and pedagogy within the mainstream education system, through activities such as parents' and elders' involvement, experiential learning, cultural camps, standards for culturally responsive schools, and native educator associations."

Now, India's efforts through NEP to include its' traditional and cultural heritage into its education system is a historic and much-awaited step. These historical efforts result from UN's sustainable development goals 2015 which was signed by India at the same time. "SDG4 ensures inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030 (Agenda for sustainable Development 2030). (UN General Assembly, 2015)".

This education policy (NEP) has attempted to cover most TK aspects, such as art, culture, literature, scientific and multi-linguistic knowledge through experiential learning pedagogy.

Unsuccessful and Successful Attempts of Integrating TK/IK in Education System: Key Lessons for India

The colonial education system's influence led drastic changes in colonized nations' curriculum and teaching methodologies. Emphasis on English as a medium of instruction resulted in the loss of interest in local languages. In colonial curriculum, the main focus was on science and technology, but

local cultural knowledge or protection of traditional arts was neglected to a great extent. For example, after implementing the British education system onto Indian soil, translations and works that used to be done in Persian and Sanskrit were entirely stopped. In all government recruitments, knowledge of English had become mandatory. Even today, internationalization of education is highly attached to imparting Education in English or publishing at international level, mostly in English journals. Language diversity's lacunae lead many local authors and new researchers in great difficulties at the international platform. It is to be noted, curriculum, formal teaching methodologies, the language of instruction, assessment strategies, faculty attitude, spending more time in schools or boarding schools out of their communities, etc. are the factors of westernized/ colonial education system. As earlier mentioned, such a system had negatively impacted TK/IK because this system had more emphasis on homogenization rather than a plurality. So, for dealing with such a problem to induce diversity and indigenous participation in the formal education system, some countries came forward and attempted to implement an inclusive education system. Not all get successful results, but they led to teaching important lessons. Such unsuccessful and successful attempts are as follows.

In Australia, there are education projects that aim to address issues of attending schools, achievements, and well-being of Yolngu youth and maintaining their cultural identity and integrity. (Marika et al., 2009). Without first consulting the Yolngu elders, the imposition of school staff or taking them in the agreement by the "Northern Territory Department of Education and Training (DET)" created tension between Australian Government and Yolngu community. The community was defending the right to choose the school staff to make it sure to employ people of good intentions and respected attitude towards their society and culture. Such tensions failed in harmonization attempts, and the project was never got implemented, that shows the negative effect of the absence of indigenous communities in the decision-making process. For, having a relevant and meaningful education for indigenous children and youth, the indigenous communities must be a party while formulating education policies. Community participation is the key to successfully implementing education initiatives.

As mentioned previously, the Intercultural university initiative and the Alaska Rural Systemic Initiative (ARSI) are two successful models. These models present the positive impact of educational initiatives. These models have characteristics such as, dialogues, balance of power in the decision-making process, and mutual respect between different parties involved. Such initiatives show a culturally-appropriate educational system, meaning thereby, "a plan that reflects the cultural diversity that includes indigenous languages." Recognizing the alternate teaching methods, which is based on different knowledge systems and other worldviews and a contextually relevant curriculum, is open to the whole society in general. (Stavenhagen, 2015)

In South Africa, New Education Policy 2005, under that policy curriculum requires science teachers to integrate the IK system with school science. In that education policy, a course to train teachers to acquire knowledge and instructional skills was mandatory for the application of an integrated science-IKS curriculum in classrooms. The result of such a guided program was that teachers who were hesitant or opposed to such integration after training in that course work found both systems of imparting knowledge as compatible and complementary. (Ogunniyi, 2007).

Similarly, to integrate African indigenous knowledge in Nigeria's formal education system, educators came forward for re-conceptualizing schooling and education for meaningful changes. They recall an approach that emphasizes local teachings by adopting integrated teaching methodology (Eze et al., 2013). They are recognizing formal and informal methods of transmitting IK. In informal ways,

learning involves play, oral literature, music, and proverbs and learning through productive works. The formal practice of transferring knowledge involves theoretical and practical inculcation of skills.

Along with the above models, UNESCO suggests for establishing Government-supported education policies about “inclusive education,” which it defines as “equal learning opportunities” (UNESCO, 2007). While UNESCO acknowledges the real limits in clustering locals with various cognitive, sensory, or physical difficulties, still it highlights the vulnerabilities that have marginalized both groups. These vulnerabilities include social inequality of access to education or schooling system, proper pedagogy, the problem of migration and displacement. There also exist issues of residential segregation and gaps in access to technology. The overall stigmatization of cultural and social diversity as a goal is also an issue that has been highlighted. For this purpose, an alternative approach can be adopted by institutions. A pedagogy and school governance that is flexible and responsive to both cultural context and community modes of formal and non-formal learning across the generations. This system should be dialogical; teachers and administrators should work with stake-holders hand in hand, sharing their collective wisdom and understanding. Inclusive education system seeks a proactively multicultural approach, and it doesn't exclude or penalize the divergent groups or individual.

So, with the above illustrations, some of the lessons that can be drawn are:

- To adopt a “Flexible and responsive” education system that includes formal, non-formal, and informal learning.
- Ensure effective participation of indigenous people in the “observation and recording of indigenous knowledge, data analysis, or the validation of documented experience through a focus group”.
- Prevent knowledge loss that results in an increase of vulnerability and risk for the indigenous population.
- Giving Equal weightage to Indigenous people's voices in planning future development agendas, providing the status of equality and respect.
- Using holistic and integrated teaching methodologies, Cultural oriented curriculum framework. Using Multilingualistic and multicultural approach that promotes inclusivity of diversity.
- Including integrated science and IK system, encouraging the practical understanding through guided training programs. Using technology to extend learning opportunities for native students, for example, Making cultural atlases, CD-ROM, website development projects etc.

So, with above discussion, we saw the importance of education and its role in preserving Traditional Knowledge. We also looked at the policies implemented, and models attempted to integrate formal Education and Traditional/ Indigenous knowledge. Now, let's begin the analysis of NEP 2020.

Indian Efforts of Integrating TK with Education System: National Education Policy 2020

Since India is one of the 17 mega bio-diverse countries, it is rich in biodiversity and its related TK. Not only that, Indian history is full of cultural, traditional, and artistic wisdom that not only includes Indian medicinal knowledge but important linguistic and philosophically advanced principles and methodologies. Historical Indian school system through ashram education, astrology, Vastu-Kala (house planning/ architecture), medicinal knowledge of Ayurveda, Siddha, Unani etc. are examples of the traditional understanding of great importance that exist from time immemorial. When we count

for necessities of human life, the things that comes first in mind is food (includes knowledge of agricultural and health practices), shelter (includes, proper housing and drainage management system), and cloths (with non-polluting surrounded nature). Indian traditional knowledge is a well-planned and well-structured. It had balanced delicate relationships among all the necessities of human well-being without harming its immediate environment; historically, it was socially and politically very advanced society. Indian TK is indeed a valuable and priceless source of knowledge that can be used in the present time to regulate public lives. It can also solve many social, political, scientific, or environmental problems occurring in nature.

For preserving and promoting such an essential traditional knowledge, a dedicated step was necessary. India has learned lessons from Turmeric cases (Mashelkar, 2001) and Neem cases (Bullard, 2005) and maintained its biodiversity register, a TK documentation register. It was recognized, praised, and adopted by WIPO. Though Indian scientific institutes and NGO's are very active in TK protection and preservation, they still, lacks in practical preservation of TK. Because the young generation of Indigenous communities or local communities is getting more attracted towards modern lifestyle or habits and technologies. Today's generation is unaware of his cultural and traditional customary practices. Sometimes, they knowingly avoid keeping in touch with those practices only for the sake of being modern and making themselves feel more urbanized. As learned above, it is essential to keep our youth involved in those practices for proper TK preservation. Some strong steps are necessary to be taken. First, the community or tribes should feel like an equal and respected member of the country. This sense of self-worth requires complete awareness of TK and its benefits in a normal lifestyle. Second, such an understanding of beneficial TK should not be restricted only within the community members. It should reach to non-indigenous people so that they could adequately recognize and respect community feelings and sentiments, and could become able to praise their culture.

The best way of spreading such awareness and mutual respect is the route of education system, and NEP is one such effort. While fulfilling the commitment to implement SDG4, India's policy envisions an education system rooted in Indian ethics, contributing directly to transforming India. "Transforming sustainably into an equitable and vibrant knowledge society, by providing high-quality education to all, and thereby making India a global knowledge superpower" (NEP, 2020).

So, here-onwards we'll examine new Indian education policy with respect to already existing policies that tried to harmonize both systems of imparting knowledge. We'll also try to find the opportunities which this policy presents to preserve India's TK/IK.

Following are the essential provisions given in the policy for transforming the education system and teaching valuable TK in the formal education system:

1. The very basis of this policy is to recognize the rich legacies. A heritage that must be preserved, nurtured, researched and put to new uses through new modes of the inclusive education system. (p.5). Here, much emphasis has been given on recognizing marginalized, disadvantaged, and underrepresented groups. Government has tried to include every section of the country with equity and respect. For representing the voices of all under-represented groups, the curriculum will be prepared jointly by "The Ministries of HRD, Women and Child Development (WCD), Health and Family Welfare (HFW), and Tribal Affairs". Also, these ministries will jointly constitute a special joint task force to guide the smooth integration of early childhood care and education into the formal school education system. Mentoring of the "early childhood care and education (ECCE)" training of Anganwadi workers or teachers

by the “Cluster Resource Centres of the School Education Department”. They shall hold at least one-month contact classes for continuous assessment. Also, there are provisions in policy such as “In the longer term, State Governments shall prepare cadres of professionally qualified educators for early childhood care and education (ECCE), through stage-specific professional training, mentoring mechanisms, and career mapping. The Government will facilitate educators for their initial professional preparation and for Continuous Professional Development (CPD)”. An emphasis has been given for tribal education as “ECCE will also be introduced in Ashramshalas in tribal-dominated areas and all formats of alternative schooling in a phased manner”. The process for integration and implementation of ECCE in Ashramshalas and alternative education will be similar to that detailed above as training Anganwadi workers etc. (p. 9).

2. The best part of this policy is that there would be no rigid separation between science and the arts, which means that the policy treats every subject with equal importance. There would be sports integration activities that include indigenous sports, ancient and modern literature, film and music, cultural enrichment and national integration.
3. To Respect diversity and respect for local context, through EK BHARAT SHRESTHA BHARAT, initiative is a fun learning and teaching rich inter- influences and differences. (p., 15). Knowledge of India has not only been recognized at international level. But there are efforts made to include them through modern teaching as knowledge from ancient India and its contribution to the current Indian system that provides for tribal knowledge and indigenous and traditional ways of learning in Mathematics and astronomy. Children will have the opportunity to read and learn from the original stories of the Panchatantra, Jataka, Hitopadesh, and other fun fables and inspiring tales from the Indian tradition and learn about their influences on global literature. All curriculum and pedagogy, from the foundational stage onwards, will be redesigned to be firmly rooted in the Indian and local context and ethos in terms of culture, traditions, heritage, customs, language, philosophy, geography, ancient and contemporary knowledge, societal and scientific needs, indigenous and traditional ways of learning etc., to ensure that education is maximally relatable, relevant, engaging, and useful for our students. Stories, arts, games, sports, examples, problems, etc. will be chosen as much as possible to be rooted in the Indian and local geographic context. Ideas, abstractions, and creativity will indeed best flourish when learning is thus rooted (p.16). There would be real inclusion of traditional and tribal knowledge through-out into the curriculum, across humanities, sciences, arts, crafts, etc., wherever it would be relevant. Special and shorter local teacher education programs will also be available at BITEs, DIETs, or school complexes themselves. Such programs will provide eminent local persons hired to teach at schools or school complexes as ‘master instructors’. To promote local professions, knowledge, and skills, e.g., local art, music, agriculture, business, sports, carpentry, and other vocational crafts.
4. To promote multilingualism in teaching and learning and to promote local language, priority will be given to local language familiar teachers; inspirational books at all levels of education in all local and Indian languages, for that state governments will provide help. Three language formula is created for promoting multilingualism. As Indian languages are among the richest, most scientific, most beautiful, and most expressive in the world, with a vast body of ancient as well as modern literature (both prose and poetry), film, and music written in these languages that help form India’s national identity and wealth. It is being taken care of

that, for purposes of cultural enrichment and national integration, all young Indians should be aware of the rich and vast array of languages of their country, and the treasures that they and their literature contain. For such a promotion, the Sanskrit knowledge system is included in learning pedagogy. Teachers will teach Sanskrit in ways that are interesting and experiential and contemporarily relevant, through Sanskrit Knowledge Systems, and in particular through phonetics and pronunciation. Sanskrit textbooks at the foundational and middle school level may be written in Simple Standard Sanskrit (SSS) to teach Sanskrit through Sanskrit (STS) and make its study truly enjoyable (p. 15). There will be extensive technological help for overcoming the language barrier or imparting knowledge to the remotest areas and training teachers.

5. As there is no better learning than experiencing with own hands, so, experiential learning has gotten a special place. The main focus of this policy is on conceptual understanding rather than rote learning. Professionals will identify specific sets of skills and values across domains for integration and incorporation at each learning stage. For that purpose, NCERT will identify these required skills and include mechanisms for their transaction in the national curriculum framework (p.13). NGOs and Government would have the option to encourage local variations and allow an alternative education model. The requirement of schools will be made less restrictive, for serving the same, some provisions provide alternative forms of schools to preserve traditions or pedagogical styles. Focal efforts would be on output potential concerning desired outcomes rather than emphasizing inputs.
6. There would be efforts to involve community and alumni in volunteering. There will also be active support and participation of active and healthy senior citizens or local community members. For experiential learning, there would be funds provided by the National Research Foundation (NRF) for quality research in different areas to appoint outstanding local artists and artisans as guest faculty. The concept of “artist-in-residence” exposes students to arts and creativity in every higher education institute. The focus has been given to promote and preserve art and culture, develop high-quality materials in various languages, and develop highly qualified individuals to curate and run museums and tourist sites to strengthen the tourism industry. The policy also recognizes that “the knowledge of the rich diversity of India should be imbibed first hand by learners”. That would mean including simple activities, like touring by students to different parts of the country, which will boost tourism and lead to an understanding and appreciation of diversity, culture, traditions, and knowledge of other parts of India. Towards this direction, “under the program of ‘*Ek Bharat Shrestha Bharat*’, 100 tourist destinations in the country will be identified by the Government. Where educational institutions will send students to study these destinations and their history, scientific contributions, traditions, indigenous literature and knowledge, etc., as a part of augmenting their understanding of these areas (p.56).

Analysis

Let’s begin the corresponding step-by-step study of the above policy in the following ways:

1. Targeting every section of society in the education system and including Tribal affairs in curriculum makes the decision an excellent step for putting forward the nuances and detailed

traditional and customary practices of diversified society through the school curriculum. Though Indian diversity is, practically speaking, rich in its social and scientific benefits, it is a massive task for any ministry to collect all valuable insights without community spokespersons themselves. Inclusion of every section in the classroom would serve two things: first, the knowledge that is beneficial for humankind could come out by the holders of that knowledge and can be used at, general, national level. Second, the community's information doesn't feel comfortable sharing with the general public that could hurt their sentiments can be avoided or limited according to their consensus or agreement. Yet, as we read earlier, community members' participation should not be restricted only for deciding curriculum or choosing teaching methodology but in decision-making bodies too. For example, when making provisions of deciding penalties, such as what to do when anyone violates their privacy or exploit the knowledge they shared for limited use or time. They should have a voice in making rules deciding how to repair that damage, or there should be the participation of community members in education ministries presenting respected states. Or as we learned from the Australian experience, there must be proper guidelines or rules for appointments in such educational institutes with prior consent or agreement with local community representatives.

2. The multidisciplinary education system has a bright future for getting multi-talented youth. Students will get the time to work on their hobbies; they would be doing what they love and securing their future by learning some job-oriented subject. But there has one concern attached to this best part, and students must not get distracted in the peer pressure of proving self-worth. Also, Tribal pupils or other local candidates should have good options for selecting their interested areas. There should be a school counselling system to properly guide students at an early stage to choose subjects according to their traits, especially when it comes to remote areas of students. In the race of being part of industrialized cities, they should be guided appropriately and not ignore their speciality or Indigenous beneficial knowledge.
3. Inculcating TK into the school curriculum is another best part of the policy. A separate subject on cultural or traditional knowledge would only become a burden, like today's environmental subject as not mandatory or whose marks would not get counted. This kind of step only derogates the importance of the subject. Including TK into science or mathematics or any other art, the issue would create curiosity in students for learning the more sustained, easy, and natural ways of solving problems and generating sense of respect towards their own or others culture and traditions. Similarly, a note of caution here attached is, while introducing any new course on TK or similar studies, the candidates choosing subjects must have some assurance of career-making. There should be a body that will take care that tribes or local communities are not getting exploited by few people even among themselves who sell the most intrinsic part of the information for commercial greed. That could hurt their very immediate environment or their very own survival by the commercialization of education.
4. Teachings and learning in the mother tongue would lighten up the weight of knowing English if you want to be called a gentleman. Three language models would help to learn other state's language. They will, also, help to understand different cultures and traditions more closely to feel the very emotions of that culture through their arts and literature, etc. Rather than imposing one language, loosening up learning medium criteria would encourage the nation's integrity.

5. Experiential learning is going to improve the work culture in India. Students will not only be introduced to many new sets of skills during classes, but they would also get chances to learn the practical nuances of a particular area. With such hands-on experience learning, students will understand the labour and emotional attachment behind every product or showcased work. This experience would make them responsible, and this step would help the holistic development of a student's personality.

For points 4 and 5 is an effective and motivated implementation of desired steps to achieve the desired results. The Education system should be kept away from commercial exploitation at any stage or by anyone. Schools should not apply these learning methods through different styles and modes only for the sake of fulfilling their duties, but teachers should be trained to be felt responsible for making the future of the whole nation. Many times, it has been seen that an environmental subject has only become a formality rather than teachers and students' responsibilities.

Conclusion

With the above discussion and analysis of India's NEP, it is clear that this is a historical step towards securing Indian TK/IK. The inclusion of TK in the curriculum and incorporation of multilingualism in the medium of instruction are some of the strong points of NEP found by any traditional knowledge scholar or researcher. If the policy as it is described and aimed, get implemented effectively that would be a boon for whole of India. This policy allows communities to get proper recognition and a chance of getting assimilated into India's mainstream population. This policy for sure provides ways of economic and social development of indigenous people or local artists. But it is required to understand before taking any step or implementing any decision in such areas that stakeholders should give proper heed towards tribal needs, demands, and expectations. Because it is not just the economic development that indigenous people ask for, "central to their livelihood is the notion of living well, which are based on a set of shared values and norms. Fundamental to these values are aspects such as community and harmonious relationship between human, nature, and Universe, and the notion of equality and complementarity" (Ibanez, 2010; Gudynas, 2011). While imparting knowledge regarding economic activities that Indigenous children can look for through their qualifications, aspects of living well should also teach them. And when touring student groups to Tribal areas, these notions and sentiments of communities must be respected and taken care.

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Environmental Change and Resource Management Strategies among the Baiga of Mekal Hills of Amarkantak Region

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Abstract — Conservation of environment and ecology is catalytic for the development of human society in sustainable manner. But the population growth coupled with technological development led to the degradation of environment that eventually leads to environmental change. Many countries are vulnerable to effects of environmental change especially in farming sector. Global extraction of resources from their respective eco systems and mines are increasing day by day. As a result, forest coverage has come down drastically and led to loss of bio-diversity. It also influences the livelihoods of the dependant people and eventually increases the poverty. The conservation dictum is well shrined in the traditional knowledge of the indigenous peoples and exhibited in socio-cultural practices like veneration of sacred grooves since their survival is depended on the rejuvenation of natural resources. But the changing environment transforming the traditional management of natural resources of the forest dwellers and forcing them to exploit their own resources for commercial interests. Keeping this in mind, an attempt is made to understand the environmental challenges and the resource management strategies of the Baiga tribes of Chhattisgarh.

The Baiga is a particularly vulnerable tribal group of Chhattisgarh, and Madhya Pradesh. They speak Baigani dialect which is mixture of neighboring Chhattisgarh. Bewar (slash and burn cultivation) is their major economy activity. However, with the contact of neighboring tribal and non-tribal communities, Baiga are practicing settled form of cultivation. Despite this fact, majority of their livelihoods depend on forest and its resources through their age-old traditional knowledge. However, they are not exceptional to the eventual impact of environmental change as well as the resource exploitation. The ongoing bauxite mining on the bordering areas of Chhattisgarh and Madhya Pradesh affected the Mekal forests of Amarkantak region as well as its resources in massive way. Due to intensive mining, major chunk of forest coverage has come down drastically and the Baiga are facing problems of grazing their cattle, collection of forest produce, depletion of water level in natural springs and borewells, soil erosion, etc. Now they have to walk down long way to harvest forest resources, drinking water and facing many problems in obtaining livelihoods. Due to environmental change, the amount of rainfall is dwindling gradually and recorded very low in the current season. As a result, agricultural crops are not yielding the expected harvest since their agriculture is still in neolithic form and rainfed. Hence, they are forced to change their traditional livelihoods and adopted alternative ones for their survival.

With this backdrop, the present paper highlights the role of environmental change in changing the traditional management of natural resources of the Baiga in the bordering villages of Madhya Pradesh and Chhattisgarh.

Keywords: forest, mining, environment, natural resources and management, agriculture, livelihoods.

Introduction

The natural resources like *jal* (water), *jungle* (forest) and *jameen* (land) is catalytic for sustenance of tribal and rural communities as their livelihoods are largely dependent on optimum utilization of natural resources. Due to its significance, the tribal communities possess rich knowledge about the available resources and its utilization during exigencies and forecast the risks of livelihoods. Keeping in view of its significance, traditional knowledge of natural resources and its utilization is enshrined in their cultural practices and transmitted from one generation to the other orally. Due to rapid increase of population and dwindling forest resources, a shift has occurred in the utilization of forest resources in the form of cultivation of millets, cereals, pulses and oilseeds. The tribal communities of India are not exceptional to this fact of view.

The tribes of central India especially the particularly vulnerable tribal groups such as Baiga once practicing the *bewar* (shifting cultivation) in Mekal forests have now resorted to settled cultivation of Neolithic type surrounding to their settlements and plain lands. Earlier they used to change the *bewar* land once in every four to five years to regenerate soil fertility in the fallow periods. The ashes of burnt clearings were used as manure. But now, Forest Department has restricted their access in forest for clearing of fresh *bewar*. This is the reason why they are practicing settled form of cultivation in the same plot for years and hence they attribute low yields due to loss of fertility of the plot. Therefore, they struggle to produce required grains during droughts for their living. As a result of contact with neighboring agricultural tribes like Gond, Panika, and Kol and non-tribal communities like Gujjar, now Baiga able to learn modern cultivation methods. Though they are practicing the cultivation of paddy and wheat, the age-old traditional knowledge and technology of resource utilization is not given up. Still the reminiscences of traditional knowledge can be seen in cultivation of traditional varieties of *kodo*, *kutki*, use of native agricultural implements, organic manure, and preservation techniques of seeds, etc. During lean agricultural season, they used to depend on forest resources through their traditional knowledge for survival. Thus, the Baiga has developed different methods of resource utilization during non-agriculture season and natural exigencies.

Besides agriculture, now a days Baiga engage themselves in cultivating vegetables in their backyard. The sale of backyard vegetables also fetches little income for Baiga. Further, the fiber extracted from the bark of *mohalayeen*, *gogu* is highly valued in weekly market and provide them an alternative source for livelihood and means of subsistence. Certain pockets of their habitat are covered by naturally grown groves of mango and *seethapalam* (custard apple), and *jamun* (black berries) in their kitchen middens. Besides, these fruit bearing trees are also plenty in *banjar* and forest lands of the respective villages of Baiga. The common forest resources are collected and sold in weekly market for income generation. Thus, the Baiga depend on traditional methods of resource utilization.

However, the ongoing bauxite mining on the Mekal hills i.e., bordering areas of Chhattisgarh and Madhya Pradesh have affected the forests as well as its resources in massive way. Due to intensive mining, major chunk of forest coverage has come down drastically and the Baiga are facing problems

of grazing the cattle, collection of forest produce, water scarcity due to depletion of water level in natural springs and bore wells, soil erosion, etc. Now they have to walk down long way to harvest forest resources and collect drinking water and thus facing problems in obtaining livelihoods. Due to climate change, the amount of rainfall is dwindling gradually and recorded very low in the study area. As a result, agricultural crops are not yielding the expected harvest since their agriculture is still rainfed. Hence, they are forced to change their traditional methods of resource utilization and adopted new ones for their survival. In the present paper an attempt is made to analyze the traditional resources management methods and its changing pattern due to environmental change by the Baiga.

In post Independent India, many scholars attempted on the subsistence system of hunter-gatherers, pastoralists, pre-industrial cultivators and even that of peasants. The studies by Porter (1965), Goldshmidt (1965), Netting (1968), Bernard Nietschmann (1973) Gross (1975), and have contributed in understanding the cultural adaptation in varied ways. Prakash Reddy's (1982) 'Scarcity and Survival' is an important work on Chowra community in Nicobar archipelago examines how a high density of population utilizes limited resources. The management of common property resources were attempted by Bromley (1991), Moran (1982), Runge (1984), Ostrom (1987), and so on, prove that communal management is largely an adaptation to the environment in times of exigencies of external conditions. Peasant and tribal movement to protect their traditional rights over the forests, as commercial forestry or mining disrupted their resource utilization pattern (Guha, 1989; Felix Padel, 2010). Scholarly works also emphasize the conditions under which humans exercise prudence in their use of natural resources and stressed on the importance of traditional coping strategies of village farmers over modern drought management techniques (Guha and Gadgil, 1992; Jodha 1992). Further, consequences of external intervention in the traditional resource use patterns led to destruction of pre-existing physical balance between croplands and non-croplands is a result of such intervention (Pandian, 1987). Conservation of resources are possible with the village level institutions rather than sustainable mining or scientific forestry (Jishnu Das, 2000). There is dearth of such studies on the Particularly Vulnerable Tribal Groups in general and Bhumia Baiga in particular in holistic perspective. The present work is an addition to the existing body of literature in the field of resource management and its changing patterns in tribal areas.

Objective and Methodology

The present study highlights the challenges posed by the environmental change in Mekal hills of Amarkantak region which closely attached to Achanakmar Bio-sphere Reserve in Chhattisgarh. It is a homeland for numerous tribal communities like Gond, Panika, Kol, Agaria along with the Baiga, a particularly vulnerable tribal group. The ongoing mining and stone quarrying in the study area posing a challenge on the livelihoods of these communities. Further this paper also makes an attempt to document the traditional as well as changing pattern of management of natural resources among the Baiga of the bordering villages of Madhya Pradesh and Chhattisgarh.

For the present study, the *Baiga* hamlets of Dhanoli *Gram Panchayat* of Bilaspur District in Chhattisgarh are selected and studied intensively from anthropological perspective. The villages covered for the present study are mainly Pakri Katchar, Khari Debra, Chuila Paani, Media Katchar, Patra tola, Karangara, and Baidkudra. These Baiga hamlets are situated on the hillocks and inside the forest of the Maikal range of Amarkantak region. The study area comes under fifth schedule and

got affected with illegal bauxite mining as well as the stone crushing units that are operated by non-tribes. The ongoing mining and stone quarrying activity in the region led to the depletion of forest coverage. The agricultural tribes like Gond, Panika, Kol and non-tribes like *Yadav*, *Gujjar*, *Choudhury*, *Brahmin* are residing very close to their settlements and also cleared forest land for cultivation. The study villages are located in a radius of three kilometers wherein the *Baiga* hamlets are interiorly located from the main village. The *Baiga* villages are scattered inside the forest and can be reached on footpaths only. Gaurella is the nearby Tehsil having seven to ten kilometers distance where Bilaspur the nearest District headquarter having more than hundred kilometers distance having road and rail connectivity.

The present study is basically a qualitative anthropological study aimed at understanding the livelihood challenges due to environmental change and the resultant resource management strategies among the *Baiga* as the socio-cultural, educational, economic, and religious life of the *Baiga* are highly influenced with surrounding forest ecology. The primary data was collected through intensive fieldwork among the *Baiga* settlements of Dhanoli *Gram Panchayat* of Bilaspur district in Chhattisgarh. The study villages are selected based on purposive sampling from Bilaspur district. In order to fulfill the objectives of the study, qualitative anthropological techniques were conceived as important for the study. These are mainly participant observation, key informant interviews, interviews, and formal and informal interviews using a detailed checklist. Separate focus group interviews were conducted with the stakeholders to understand the changing pattern of resource management. Further, household census schedule are used to collect data pertaining to agriculture, income, land, etc. The secondary sources like books, journals and census reports are consulted to understand the conceptual framework through review of literature.

The Lives and Livelihoods of Baiga

Baiga is one of the Particularly Vulnerable Tribal Groups (PVTG) of Madhya Pradesh and Chhattisgarh. They are classified into seven sub-categories known as the *Binjhvars*, the *Bharotiyas*, the *Narotias*, the *Raibhainas*, the *Kathbhainas*, the *Kondwans*, and *Gondwainas*. They speak their own dialect known as *Baigini* which is intermixed with Chhattisgarhi. Their social organization is divided into several endogamous *jat* (groups) subdivided into exogamous *garh* and *goti*. Social relationships between the different *jat* are governed by a series of detailed and rather complicated regulations (Elwin, 1932). Marriage by mutual love and elopement, marriage by service, and marriage by negotiation are the existing and socially approved forms of marriage. The practice of monogamy is widely observed in the study villages. Divorce and remarriages are common. The custom of bride price is prevalent in study area and it is paid either in cash or kind.

As per household census, the total population of the *Baiga* hamlets comes to 1334 consisting 656 male and 678 females. when compared to non-tribal population, the female population of *Baiga* is outnumbering the male population and the role of women in their family and economic life is noteworthy.

Table 1: Demographic details of Baiga Settlements in Dhanoli

Sl. No.	Name of the Village	Male	Female	Total
1	Karangara	140	159	299
2	Baidkudra	32	43	75
3	Media Katchar	154	151	305
4.	Chuila Paani	151	143	294
5.	Pakhri Katchar	97	101	198
6.	Khari Debra	82	81	163
	Total:	656	678	1334

*Author's field survey, 2015

At present, Baiga of the study area practice age-old form of agriculture by using simple tools and technology. They cultivate traditional varieties of *Kodo*, *Kutki*, *Ramtila*, *Ulsi*, *Teera*, *Masurdal*, *Channa*, *Paddy*, *Wheat*, and *Maize*. *Pej* (porridge) is a kind of semi-liquid staple food prepared daily for consumption. They hunt small animals like *Chitar* (Deer), *Barha* (pig), *Khargosh* (rabbit) and fish in nearby water bodies. Further they depend on forest for both timber and non-timber forest produce for their sustenance.

Traditional *Baiga* jurisprudence governs tribal life to a greater extent than regulations established by state. This jurisprudence is concerned chiefly with the maintenance of tribal integrity and prestige. Control is maintained by tribal excommunication, fines, and beating. These matters are decided by both informal procedures (i.e., by nonstructural consultation of various community members) and formal procedures (i.e., by the village ward member).

Gao Gossain is the main sacred place of the *Baiga* which is located at adjacent of the *Sarai* and *Kamar* trees in the forest hills. All the community related festivals and agriculture related ones are celebrated communally at this place. Wherein *Maskasi Narayandeo*, and *Thakur deo* are believed to stay. Further, they also worship *Bura deo*, *Dharti mata*, *Agni deo*, *Ghamsaan deo*, *Dulha deo* similar to nearby Gond. *Bura deo* is also worshipped once in three years. On that auspicious occasion, they sacrifice a goat or hen, pig, newly made *Mahuwa* liquor, ganja, and so on. Besides some of them do offer worship to the deities of Hindu Religion along with pious saints.

Traditional Resource Management

Natural forest resources play a very important role in the subsistence of Baiga and hence they manage the resources in sustainable manner. They have traditional knowledge about the forest resources which is not only used for livelihoods but also useful in coping with any shocks and risks during exigencies. This knowledge is well shrined in rituals for conservation of the resources. The Baiga, in the study area, continue to depend on their traditional methods of resource utilization and management for livelihood despite outside interventions. The sustainability of their traditional livelihoods is linked to their knowledge, institutional mechanisms, value system and co-operation among its clan and lineage members. This gets reflected in observance of their elaborate ceremonial rituals. Baiga has institutionalized rules and regulations to restrain individuals from over exploiting the resources. They believe that the trees belong to *Peepal* and *Bheeja jhaad* (tree grove) is considered as *Thakur deo*.

Chula (fire hearth) is considered as the abode of the deities since it is providing food by them. The religious veneration of natural resources is a mechanism of restraining individuals or groups from over exploitation of their natural environment.

The management of natural resources like collection of minor forest produce, maintenance of kitchen garden, raising poultry, rearing cattle, pigs and goats, etc., are the major concern of each and every family. This management can be observed starting from the land allocation to agriculture, fishing and hunting, observance of ceremonies and feasting. They are undertaken by family with the assistance of *lineage* members, as these tasks require collective effort rather than individual effort. Prior to understand the impact of environmental change on the resource management of the Baiga, it is pertinent to study the traditional methods of resource utilization pattern at first instance.

Land is the main source for the subsistence of Baiga and its significance is evident from the elaborate rituals such as *haryali*, *bidri*, *kujalayya*, and so on associated with it and agriculture. Most of the available land is used for different purposes like *doliya* (wet cultivation), *parthu* (dryland cultivation), *bhadi* (kitchen garden), *donger* (forest), *banjar* (cattle grazing), hilly uplands, etc. It is basically ancestral property which is inherited from their lineage and close kins. It is stated by the Baiga of Baidkudra that earlier they used to stay in the villages of Umarguhan and Jaleswar. Due to increase of their population, they came to the present village and cleared the forest for *bewar* (shifting cultivation). In due course of time, they settled and practicing settled agriculture. The wet and dry land including kitchen garden are treated as personal property whereas the forest, *talab* or *bandh* (ponds), burial ground, *banjar*, and hilly uplands are common property for the Baiga and utilized by all the villagers. For example, *mahuwa* trees in forest are common property and they are subjected to use for that particular village.

Earlier, they were practicing *bewar* (slash and burn cultivation) since generations in the Maikal hills of Satpura range. However, the Baiga of the study area at present not practicing this cultivation. But few patches of *bewar* terraces are found inside the forest area where they are practicing *bewar* clandestinely. In case if it is known to others, the forest officials destroy the crop and confiscate their cattle and other belongings. Hence, majority of them are now practicing settled cultivation with the impact of *kisan* (Gonds are popularly known in the area) and non-tribal peasants.

The cultivation of land is based on joint family basis. In the event of separation of family on the account marriage or dispute, individual farming is undertaken. Wherein lineage or family cooperation is mandatory to execute major works like *rupai* (seedling), *nidai* (weeding), *katai* (harvesting) in the fields. Mixed cropping is a characteristic feature of the Baiga agriculture where millets, cereals, pulses, and oilseeds are grown in one plot. It is coupled with cultivation of vegetable leaves and tubers.

The landless Baiga share the agricultural land of others and undertake cultivation with their hard work. The expenditure and investment is the responsibility of the land owner whereas the landless offer only labors. Finally, the harvest is divided equally by the land owner and landless.

The traditional crops like *kodo* (small coarse millet), *kutki* (small millet), *jowar* (great millet), *makka* (maize), *madiya*, *kang*, *sawa*, *balihari*, *ulsi* (oilseed), *ramtila* (oilseed), *tiwda* are cultivated by the Baiga since generations along with *gehu* (wheat), *dhaan* (paddy), *muttor* (pea), *masur* (dal), *rai* (mustard), *rahar* (tore dal), etc. During monsoon period, all the ponds and pools are filled with water and it is used for irrigation purpose.

Generally, before rainy season (South-west monsoon), all the Baiga families start preparations for agriculture in the month of April by engaging themselves in removing leftover crop of the last year. The ploughing is undertaken thrice i.e., after the first shower, leveling, and lines for sowing. After two months of the sowing, they undertake weeding and started harvesting the crop one another depending after four months.

Table 2: Cropping Pattern in the Study Area

Season	Type of Crop
Kharif (June-October)	<i>Kodu, makka, dan</i> (paddy variety 110, 22 number, <i>niwari, dudhraj, lohandi, chepti, bharra, tara</i>) <i>kutki, arhar, urad, hirma</i> , etc.
Rabi (November-May)	<i>Rai</i> and <i>masur, channa, butterie, gehu</i> (wheat), etc.

*Author's field survey, 2015

The lands surrounding to the Baiga houses and the plain lands on the hill slopes are used for dry cultivation. These lands contain matured trees, as they do not remove *mahuwa* and *sarai* trees in their fields. Since these lands are rainfed, crops like soya bean, *kodo, kutki, ulsi, rahar, urad, chana* are grown in them. Compared to wet lands, the yields are low in dry fields. The process of cultivation involves ploughing, which is done twice, and seeds of different varieties of millets and cereals are broadcast in the same plot as mixed crop. The dry land cultivation is known as *bharra* among non-tribes.

The wet land cultivation is known as *doliya* in Baiga dialect where in paddy is grown in *kharif* (June-October) every year. Unlike non-tribes, they do not venture for *rupai* (seedling). Rather they broadcast the paddy seeds at once. After harvest of paddy, the other crops like *masur, tiwda, gehu*, etc., are sown as second crop. The non-tribal call it *bandiya* where intensive rice cultivation is practiced.

The flat agricultural fields in the catchment of ponds (low laying areas on the catchment of big dam where rainwater gets stored) are used for cultivation paddy. The trees like *mahuwa* and *sarai* in the *doliya* lands are not cleared by the Baiga. These water-logging places facilitate irrigation for cultivation of *paddy*. Besides these natural water bodies in other low-lying areas, the Baiga build earthen bunds to prevent the flow of rainwater in slopes. Soon after rains, the Baiga plough *doliya* lands with the help of their cattle once or twice.

The cultivable land is cleared during summer and removes previous plant wastage and grass. At first instance, they tilled with the help of *nangaar* (plough). After shower of rains, the land is once again till the land with *bukkad* and broadcast the paddy seeds. After two months, *nidai* (weeding) is undertaken to remove *khatphatward* (grass) in the month of *sawan* (July) and *bhado* (August). Thereafter harvest is made during *karthic* (October) or *pus* (December). In case, the harvest is in small quantity, they carry it on head loads to their house where *kanyal* (thrashing platform) is present or else they prepare *kanyal* near to their field and thrash after drying in the field. In case of failure of rains, all their efforts are become waste as it involves more labour. Now a days, they also paying wages for agricultural works among themselves.

Production of vegetables in their *bhadi* (backyard) is also one of the subsistence activities practiced by the Baiga. During the onset of monsoon, they cultivate *jowar, makka, rahar, kheera*,

kakadi, *pihti* or *bhadeli*, etc. Besides this, they also cultivate different vegetables like *semi* (beans), *papita* (papaya), *khela* (banana), *aam* (mango), *bihi* or *amrut* (guava), *bhata* (brinjal), *pathali* (small tamato), *dhodka* (a variety of plain gourd), *lauki* (bottle gourd), *turai* (ridge gourd), *karela* (bitter guard), *kumda* (pumpkin), *kalindra* (*kaddu*), *mircha* (chilli), *pyaaj* (onion), *aalu* (potato) and different varieties of leafy vegetables like *purpuribaaji*, *kotnibaaji*, *meitibaaji*, *palakbaaji*, *albaaji*, *raibaaji*, *batuvabaaji* along with muttor (peas), *muli*(raddish), *phoolgobi* (cauliflower), *pattagobi* (cabbage), etc. These are produced for their own consumption. They do not make use of chemical fertilizers and other artificial inputs for increasing its productivity.

Preparations for the kitchen garden are taken up before the onset of rains. All the families of Baiga clear their backyard by removing grass and dried plant vines with the help of *gaiti* (*spade*), *phavda* (*hoe*), *hasiya* (sickle). It is a household activity wherein both men and women participate. Women spend most of their time in clearing the backyard while men often are engaged in plantation work. Women spend at least a couple of hours every day and attend to the works like removing the weeds at the base of the plants, providing support to the creepers, replacing dried plants, and constructing fencing, etc. Children also help their parents in such gardening works. The cultivation of vegetables also sold in the weekly market but it depends on the supply.

Cow, ox, goat, pig and poultry birds constitute the major stock of the Baiga and are having socio-economic significance. It is one of the chief sources of livelihood and used for sale as and when required money. Even they use livestock as bride price in terms of marriage and it is obligatory to slaughter this stock in almost all the ritual occasion. As such, it ensures the continuous supply of protein in the form of sacrificial meat. Livestock are used in exchange to procure certain goods like bamboo baskets and mats, *mahuwa* flowers and consumable goods from non-tribal traders in weekly market. Baiga treat livestock as an asset and these constitute part of payments of fines imposed by *Kula Panchayat* as part of dispute resolution. The livestock are not only economically useful, but has a social value too. It is customary to offer bride price in the form of cattle during marriage. It is obligatory to slaughter pig, goat and chicken during festive occasions, and during both the annual and life cycle rituals. If someone becomes ill, *gunia* offers a particular identified fowl or pig to the deity or spirit. Thus, the livestock plays a pivotal role in the socio-religious life of Baiga.

Barter exchange of cattle is practiced with the non tribes. For example, the *gai* (Cow) is exchanged for *bail* (buffalo). Sometimes they purchase the cattle ranging from Rs. 3,000/- to 10,000/- based on the age and performance of the cattle.

Forest plays a pivotal role in the socio-economic and religious life of the *Baiga*. In forest, they collect Non-Timber Forest Produce (i.e., *mahuwa*, *tendu* leaves, gum, and resin) wild vegetable leaves, roots and tubers, wild berries and fruits. *Baiga* often venture for hunting of wild game and birds in the forest during ceremonial occasions. In case of failure of rains and agriculture, they totally depended on forests for survival. Due to its significance, the *Baiga* have developed a symbiotic relationship with forest and started worshipping many deities. Thus, conservation of forests is enshrined in their socio-cultural mechanisms since their immediate survival is depended on it.

During lean period, the Baiga men and women collect roots and tubers from the forest with simple hoe and digging stick. They use it as substitute to their regular food. Further some varieties of roots and tubers are having demand by non-tribes and hence it is sold during weekly market. Due to its commercial value, some varieties are cultivated in kitchen garden. Baiga identify different variety of roots and tubers based on previous cite marking, based on thickness of *bela* (tuber vein), based on

softness and thorns, colour, size of the leaves, nature of soil around the tuber, etc. Whenever they collect *kaanda*, some portion is left for its rejuvenation. In *baisakh* and *jait* (hot summer), no roots and tubers are available due to burning of forest. During *aashad*, the onset of first monsoon the veins of previous one start sprouting.

The dug-out roots and tubers are processed through two methods i.e., boiling and roasting in fire before consumption. *Kirchikanda* is consumed in raw form or roasted on fire. *Kanyakanda* is available in deep dug outs and used exclusively for vegetable purpose. It is extracted in huge quantity and stored in the soil. It is preserved till two to three weeks. *Suran (jimi)*, *kochai*, and *guiyakanda* are other varieties that are consumed after boiling and roasting. The leaves and tender trunk of these tubers are also consumed in the form of vegetable. For income generation, the Baiga now a days cultivating certain varieties of tubers like *saklakaanda* in *bhadi* and sold in the weekly market for income generation.

The season lasts for about two months July-August and the big size variety is available up to even September. Depending upon the climatic condition, soil and location, many varieties of mushrooms are available in the forest and that are consumed as alternative food resources by the *Baiga*. The excess collection brought to weekly markets for sale and procures essential commodities for their daily use.

It is available during the month of June and the season lasts for about two to three weeks. At the outset of monsoon with great thunders, the *puttu* are found at the surface of the soil which is covered with leaves or soil. The collected *puttu* is consumed as vegetable and sold in the weekly markets for earning income since it is very costly.

Many varieties of wild vegetable leaves are collected by the *Baiga* from the nearby forest. They are mainly *boilam*, *katchar*, *taini*, *gojari*, *kavaiah*, *barai*, *koilar*, *amti*, *kitchnar*, *munga*, *dhandahera*, *birhul*, *pakri*, tender Peepal leaves, *chunchuniya*, *teenpatti*, *kutuwa*, *kusum*, *katwal*, *pakh*, *kanta*, *charota*, *purpuri*, *jillo*, *cheaibaaji*, *girulbaaji*, *dhopebaaji*, *kevlarbaaji*, *karilbaaji*, *peeparbaaji*, *amla baaji*, *kereyabaaji*, *lamer baaji*, *tinsa baaji*, *chirotibaaji*, *pakadibaaji*, *maasibaaji*, *gumibaaji*, *kuraiahbaaji*, *kachadbaaji*, *baramrakashbaaji*, *channabaaji*, *rai baaji*, *munagabaaji*, *koilaribaaji*, *mahurbaaji*, and so on. They use these leaves as additives by mixing with other vegetables, meat, and fish. The excess collection is sold in weekly market. Some of the vegetable leaves are also consumed for the purpose of medicinal purposes also by the *Baiga*. The tender leaves of matured trees like *chakoura*, *batuwa*, *tiwara*, *kutni* that are available in the forest and agricultural fields also consumed by the *Baiga* during season.

Hunting is a part of the *Baiga* socio-cultural life and the game like *Chitar* (Deer), *Barha* (wild pig), *Khargosh* (rabbit), *Jungly suvvar* (wild pig), monitor lizard, etc., are hunted by using the traditional traps and implements. Now a days they are hunting small game like rabbit, deer, wild pig, monitor lizard, etc. Besides such small game, some of the birds like wild fowl (*jungly murgi*), *ghotri*, *sambar*, *mor*, *lakadbakka*, *cheetah*, rabbit (*khargosh*), *pondki*, *telha*, *chechan*, *bach*, pigeon (*kabotar*), etc. For hunting, they use bow and arrow, gun (bandook), traps (*pandha*). In forest, small and big wild fowls like *podki*, *teha*, *chechan*, *baaj (cheel)*, *kabutar*, etc., which is crawling not flying are hunt along with hunting implements.

Baiga use traditional traps like *sura phanda*, *gopi panda*, *chulagi panda*, *basurijhala*, *barhi*, *hagiya*, *chirchirawood*, *baaskadabkarpanda* (bamboo bird trap), *saang*, bow and arrow, *bagur*, *gola*, *badadhopi*, *suuripanda*, *kamanisarkajundpanda*, *dalgapanda*, *yogpanda*, *cheera* net, *bagdhanurha panda*. The implements used in hunting are made of bamboo and little bit scrapped iron. The arrow

head and other iron implements are procured from nearby weekly markets. Unlike the tedious method of hunting, they rely on traditional trapping technique to catch wild animals.

Baiga catch small fish in the surrounding *nallahs* (rivulets), pond, dam, and river. It is practiced in both group and individual. They do not use any modern fishing nets instead they use simple tools and technology. The fishing tools are completely made with bamboo splits with a coiled technique. Generally, they remove water from the small ponds and use bare hands and sticks to catch the fish. Whereas fishing in big tanks, they use bamboo traps and mosquito nets. *Katla, mirgal, rehu*, B grade, etc., are the local varieties of fish that are available in ponds. It is a leisure activity for the Baiga and practiced in a group rather than single person or else it is familial activity in majority of the cases since it require the collective effort.

Climatic Change and Environmental Challenges

Since 2001 onwards, the bauxite mining and stone quarrying is extensively undertaken in the study area and affected the forest land and its resources in massive way. Due to intensive mining, major chunk of forest coverage has come down drastically and the *Baiga* are facing difficulties in grazing their cattle, collection of non-timber forest produce, depletion of water level in springs, soil erosion, etc. Now they have to walk down long way to harvest forest resources and have had impact on their traditional utilization of forest resources.

In 2015, very low rain fall is recorded in the entire Chhattisgarh state and the study area is also impacted with the environmental change of drought. Since the Baiga agriculture is rainfed, the paddy crops are dried and majority of them left their cattle in the fields for its grazing. Due to deforestation, the utilization of forest resources has also come down and they have to walk miles away to collect minor forest produce. During this time, they depended on wage labour and the relief provided by the state government in the form of public distribution system of rice, wheat and other essential commodities.

Local Environmental Change

At present, the Baiga of the study area fetch fuel wood on head load from the nearby Karangara forest on barefoot walking at an average distance of four to five kilometers. Further, the daily requirement of hardwood for carpentry works, for making new houses, doors and windows, etc., also procured from the far away forest. The stone quarrying from the residential as well as in the Baiga agricultural fields are continuous for earning their livelihoods. Thus, extracted wood is either sold to the contractors who are obviously non-tribes.

Due to mining and stone quarrying, deforestation is taking place in the study area. Traditional management of land and forests like shifting cultivation and collection of forest resources has come down drastically. Even hunting is practiced symbolically during festive occasions as the game is not available. The availability of wide variety of roots, tubers, wild vegetable leaves, mushrooms, tender bamboo shoots, etc., has come down and Baiga seldom visit forest for its collection. Baiga has to walk miles away to fetch these resources. Hence, they avoid the tedious effort in collection and management of these resources for livelihood. Rather the Baiga now resorted to alternative livelihoods such as wage labour for their survival.

To tide over the drought condition in 2015, the government has launched *Sukhrati Yojana* (drought scheme) which provide monetary relief to the affected families. Now the Baiga of the study

area are encouraged to revert back to their traditional crop varieties like *kodo* and *kutki* since with little rain they harvest the crop.

The construction of grand trunk road is underway in the study area which starts from Gaurella and cuts off Dhanoli *Gram Panchayat* to the newly established Tribal University. The individuals from the study area are working in these projects in various capacities ranging from leveling the land, segregation of stone, construction of drainage bridges, etc. Further the wage labour under forest department, house construction, digging of wells, vegetable cultivation, and more importantly the work at Indira Gandhi National Tribal University also contributing to their economy. Thus, earned money is spent on purchase of essential commodities, mobile phones, television, bicycles, motor cycles, non-consumable goods like fridge, almirah, table and chairs.

Coping Strategies

Baiga of the study area now resorted to nearby the towns for wage labour in massive way. The places Baiga often visit for work is Gaurela, Jhagarakhand, and Gorakhpur as labourers for house construction, growing of commercial crops like onion, vegetable, litchis, etc. They have been going for work in groups ranging from 10 to 20 members, and the concerned owner provides transport for going and coming from their respective hamlet or village. Whenever the non-tribe of the nearby village or from Gaurela need labour, they approach the Baiga hamlets and inform to the road side households or the individuals who can communicate to the rest of the villagers. Sometimes, after seeing the vehicle on the road, it is presumed that the somebody needs wage labour and those who are interested or really need money board the vehicle. But whatever the work, Baiga were given payment on weekly basis to meet their requirements at weekly markets. As such the following table reveals the existing diversity of livelihoods available to the Baiga in the study area.

Table 3: Details of Alternative Livelihoods among the Baiga

Sl.No.	Type of work	Wages in Rupees	No. of Days Available
1	Rupai (non-tribe fields)	120/-	One to two months
2	Harvest	120/-	One month
3	Road laying work	150/-	One or two weeks
4	Wage labour in Crusher	120/- to 180/-	Non-agricultural season
5	MGNREGA	159/-	Non-agricultural season
6	Construction work (building)	150/-	One week for a month
7	Agriculture labour	60/- to 70/- (Baiga only)	June to December
	Agriculture labour	100/- (non-tribe)	June to December
8	Forest labour	200/-	Summer
9	IGNTU labour	223/-	Very often

*Author's field survey, 2015

From the above table, it is clear that except government works, remaining private works wage are low. The Baiga were being paid low wages for both male and female when compared to State and Central government wage rate. Besides the wage labour, they also undertake the stone quarrying in their fields during leisure times. It is not based on daily wage but on contract base. One family wholly engaged in extraction of stone and they were being paid Rs.1300/- per tractor trolley. Sometimes owner of the field extract stone or allow the outsider to do so. In such cases, no monetary benefit was given to the land owner as they believe that it is useful for them for making the plot for agricultural use by removing stones from it. Thus, collected stone are sent to crusher and in turn they sell one trolley full of stone chips at the rate of 3200/-. This business is being done by the non-tribes in the study area.

Altogether six stone crushing plants are working in the study area i.e., four crushers in Dhanoli and two are in Karangara. Majority of the *Baiga* including male and female are working in these crushers and the wages are vary from one crusher to another. The nature of work in the crushers is very hard as they have to carry the stones on headloads. Hence, the Baiga cannot venture to crusher work regularly. They avoid it during agricultural and collection of *mahuwa* and *tendu* leaves season.

Employment in Mining

The Baiga of Karangara and Baidkudra are engaged as labour in the mining related works like loading of bauxite in trucks. It is based on contract of Rs. 150/- to fill one truck irrespective of total number of labour engaged and how much time it consumes. Nearly 6 to 8 individuals continuously work to fill one truck and it will take more than one hour. Afterwards they take rest and again load another truck. Likewise, altogether Baiga load at least 6 to 7 trucks per day. On sharing, the contractual amount, each individual used to get Rs.60/- to Rs.80/-.

Conclusion

The traditional management of resources are crucial in sustainable utilization of natural resources for livelihoods of Baiga in the study area. Due to this reason, conservation is enshrined in the rites and rituals of the Baiga for future generations. However, the ongoing mining and stone quarrying led to environmental change in the form of deforestation in the study area causing many difficulties in procuring livelihoods from the forest.

Due to this, *Baiga* facing problems of grazing of cattle, collection of forest produce, depletion of water level in springs, soil erosion, etc. As a result of dwindling of forest resources, they are now adopting new livelihoods such as wage labour in road laying, house construction, working in stone crushing units, mining, etc. Thus, spread of mining activity in Mekal hills have had disastrous impact not only on the forest ecology but the culture of Baiga at large. Unlike the Niyamgiri where forest land was allotted to mining companies, the study area mining activity was officially banned by government after completion of lease to BALCO in 2009 but still it is continuing illegally. Since the area comes under the border of Chhattisgarh and Madhya Pradesh and illiterate Baiga could not resist the mining contractors. Though the study area comes under fifth schedule, the lack of awareness of poor tribals, absence of non-governmental organizations, vested interests of local politicians mining activity is continuing unabatedly. The mining contractors luring the local Baiga of leasing their ancestral lands for huge amount of money but in practice they receive very less. If this mining continues further, it will definitely led cultural genocide as argued by Padel and Das in the case of Niyamgiri.

Despite of this, still Baiga of the study area depended on the forest during exigency and failure of crops. Keeping in view of its significance, it is the need of the hour to prevent the illegal mining in the *Maikal* range and massive afforestation programme has to be undertaken by the forest department to ensure the forest related livelihoods to Baiga.

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Book Review

Head Hunters Culture- Historic Culture of Nagas- Joseph S. Thong. (2012)

New Delhi: Mittal Publications. pp. 175 + xv. ISBN: 81-8324-154-9. Price: Rs. 495/-

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The author of this book has presented descriptive information of the Naga tribe who were once known for head- hunting. Head- hunter's culture is a very old tradition once practiced by the Nagas, inhabited in the states of Nagaland, Manipur, Assam in India and in Myanmar who migrated from the South East Asian countries long past. This tribe is differing from rest of the communities of India in origin, language, food habits, dress pattern, beliefs, religion, social customs and tradition. It is said that they used to chop the head of their enemies after the battle is over and bring those at home as a memory of victory in addition to prove their valour and to appease their god in order to increase their fertility, good luck and well-being of their people. The practise of head- hunting resides in the heart of the Naga culture and all other life cycle rituals and activities and also inter woven with this. The inseparable part of the Naga culture like village society, construction of house, construction of village gate and its decorations, chieftainship, dress and ornaments, occupation, rituals, marriage, clan system, fairs and festivals, etc. are all centred round and linked up with head- hunting and Feast of Merit which are same in almost all the sections of Naga tribe except some minor variations from village to village, clan to clan, etc. This is a distinctive feature of the Naga tribe which makes it different from the rest of Indian communities which is generally governed by caste system, *zamindari* system, *jajmani* system, etc.

Although many books has been written on Nagas by many British administrators, Christian Missionaries, Naga National Workers, journalists, travellers, military personels, local administrators, academicians, researchers and son on, but so far as the author's knowledge, no comprehensive book that covering all the aspects of the culture of the head- hunting community has been written to quench our thrust for knowledge. Hence, through this book the author tried to present us a complete picture of Naga culture. Various components of traditional Naga society have been described in brief.

In present day also, in the interior rural villages one can see the historic culture still prevalent without any change and are transmitted from one generation to another through the aged people whose ways of life have not changed for centuries. Apart from it, the material culture likes the wood carving craft, cloth weaving, pot making, dresses and ornaments, weapons, tattooing, dyeing, folk songs, dances, etc. also served the author as primary data to reconstruct the traditional culture of the Nagas. For the collection of first hand data he also applied participation observation method. The data are also collected from the information received from the informant from the field and from the books listed

in the bibliography. For the collection of data, the author has gone through very systematic method like library method, historical method, documentary method, questionnaire method, schedule method, interview method and participant observation method.

This book serves as a guideline for the students, research scholars, academicians and teachers of Social Sciences like anthropology, ethnography, sociology, culture, tribal studies, law, society and technology. The book is also very helpful to know more about the life style of the Naga head-hunters. Apart from it, it will serve to the candidates who are preparing for competitive exams, college and university exams related to tribal culture and society. The administrators also be benefited from this book who were serving in tribal and backward areas as this book is providing information related to tribal culture, their ways of life, tribal beliefs, values, customary laws and justice, political and social organization and other relevant information. Through this book the author tried to document those lost intangible and tangible culture heritages that are lost or about to lose.





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