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PEDOGOGICAL ASPECTS OF R.BERDIBAEV IN THE CONTEXT OF GLOBALIZATION

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ABSTRACT
This article is devoted to “An ancestor Korkyt” of Turkish people, an academician of the National Science and some other International Academies’ academician, an honoured worker of science of Kazakh KSR, a possessor of an award named after Shokan Ualikhanov of the National Science Academy, a possessor of “For the honored work in Turkish world” national award named after Makhmud Kashkari, a possessor of “Parasat” and other medals and awards, a person of a high honour – Rakhmankul Berdibay. His published works such as “The nightingale of Gulstan”, “In a ship of friendship”, “From Baikal to Balkan”, “The light of the stars” were devoted to the literature, to the spiritual connections and historic roots of relative Turkish people. In the scientist’s work “If we want to be a state”, the dreams of the people raised bravely. Rakhmankul Berdibay’s award “A state award for an enormous work in Turkish world”taken from the president of Turkey had been the proof of our opinion of him. It is evident that the views and a credo of a scientist about Turkish people would make the Turkish people be close to each other.

INTRODUCTION

In the Republic scientific-theoretical conference “The readings of Rakhmankul Berdibay - 1” which were held on the 14th of November in Turkistan, a doctor of philological sciences, professor, an advisor of the rector of Suleimen Demirel University Dandai Iskakuly had concluded his article “Rakhmankul Berdibay and an Eternal State Idea” with his following valuable point of view: «Manash Kozybayev, an academician: «Rakhmankul is a leading man who very early “climb” the top of Kazakh culture and who was the first to rule the people! Rakhmankul was a man of quick idea who had a prompt style of writing. First of all, he is a person of an encyclopedian knowledge. Secondly, he works very hard not to fall down a person in dirt. The process of growth is a heart of his creativity. Thirdly, a national process is characteristic to Rakhmankul, in the process of research he gets not only the essence of the national source, but also nutrition and pleasure. He is as a bee collected nectar from a thousand of flowers…! Safuan Shaimerdenov, a writer: «I can point out two character traits of Rakhmankul Berdibay, a famous researcher of literature, a scientist, a critic. The first character trait – his national patriotism, namely a Turkish patriotism . A dream of a scientist was to unite all the generation of Turkish people, to make them be close to each other that became far from each other because of the cruel policy for about 70 years, to realize the idea of uniting relative languages and be the one. This is the centre of Rakhmankul’s creativity. The second character trait is the scientist’s researching»; Ozbekali Zhanibekov, a public figure, historian-ethnologist: «I remember, ten days later , after I was elected as a secretary of a Central

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Committee, I had to speak before the plenary meeting of the Writers Union of Kazakhstan. And at this meeting Rakhmankul Berdibay was the first among the famous figures to suggest Nauryz to be a holiday»; Kenesbai Mussaev, an academician (Moscow): «Rakhmankul is a scientist who tried to persuade to love our own Motherland, our people, our land and culture, language and history for the whole life... He was known as a figure to develop and prosper our national culture and one of the prominent representatives to go with a motto: «Awake, Kazakh people!»... Rakhmankul was a leading person and a scientist to propagate Turkish people's spiritual wealth among Kazakh people... A great scientist, a prominent educator Rakhmankul is the model for future scientists and an example for the youth!»; Rymgali Nurgali, an academician: «Everything he did, writing an article, or a book, taking part in the work of National University, speaking before the auditorium, scientific meeting, radio, giving a suggestion to respected foundings, the basis of Rakhmankul Berdibay's writing and social activities was caring for people, concern for nation, the idea of independence, the motive of liberty»; Chingiz Aitmatov, Kyrgyz writer: «Rakhmankul Berdibay, from my observations, Kazakh literature and its scientific thought always differ by their shape proportion of vision and analysis, by comprehension of the deep essence of Kazakh poetry. And, You are one of the leading thinkers in this intellectual sphere»; Sheriff Aktash, Turkish researcher: «An ancestor of Korkyt, a prominent researcher Rakhmankul Berdibay's place is different among other figures who work hard on the unity of Turkish world. We sincerely respect Rakhmankul Berdibay as an outstanding scientist and a great personality. Now, having turned into "an engine" of turkish ideas during Red empire, he didn't stop his activities in the unity of Turkish world... Beginning with folklore in Kazakh land, having reached the success in the unity of manner and culture formed in the Great Turkistan, Rakhmankul Berdibay became our today's ancestor of Korkyt»; Abdyldazhan Akmataliev, Kyrgyz academician: «Kyrgyz writers respect and worship Rakhmankul Berdibaev very much... His works on the study of folklore having been an example and it serves as a necessary model for Kyrgyz researchers... Rakhmankul Berdibaev is a researcher of two countries who strengthened and made the connections of kyrgyz-kazakh science firm»; Sarygul Bakhadyrova, professor, Kara-Kalpak writer: «Kazakh people – a nation which gave a famous, researchers and poets to the world. I can point out a talented representative of literature, of the study of folklore, the most famous and great person in Middle Asia nowadays, an academician of Kazakh National Academy, professor Rakhmankul Berdibaev» - she said. From the poet Temirbek Medetbek's poetry:

«Each his word was like a tale,
As an ancient wise ogyz.
He is full of longings,
As a black kobyz...
Each his days are full of thoughts,
He had a good birth.
Rakhmankul Berdibay,
He was a real Turkish» - such views were written about him, and she continues her thought of him with the following: "of course, after such brilliant words it is difficult to say something about R. Berdibay. Nevertheless, it wouldn't be unnecessary to share opinions of a man, whose name is familiar to Turkish world, to everyone, about a man, who was seen at a very height». «People, who sincerely love their countries and Motherland serve their people and country mostly, in all difficult situations, in the fields of honour. We are proud of the heroism of these men, who were ready to die for their country and their people, who opposed and resisted the enemy in the bloody battle. The fact that the future of the nation, people and country depends directly on the love of each member of the country, on his devoted service to it and the ability to be defended in case of war is an axiom that doesn't require any proof. Nevertheless, such national heroism are not shown in the fields of honour; but also in every day life, in a peaceful day also. Though we say a peaceful day, such days also are full of the great activities made for our future and we should confess that we don't notice it in our everyday life being busy with our own problems. Usually we award labour heros but we don't notice the heros of the national spiritual life. Though such heroisms are seen and known by educated and

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cultured figures and told as a national pride, they may not be familiar to the people. The services of such people turned into heroism as a citizen duty and are loved by all people. So, Rakhmankul Berdibay was the first who did a spiritual heroism, waking the people who forgot a national self-awareness and feeling the danger of the battle" having made such comparisons full of deep content, she evaluated Rakhmankul Berdibay's being and facial features in the society (D. Yskakuly. 2014).

We also have something to say. We were his pupils. Rakhmankul Berdibay had learnt us the methods of writing scientific articles. In order to do scientific-theoretical researches, he had learnt us to collect materials, to make its scientific basis, to systematize, to research them from theoretical point of view, to improve our knowledge by making an analysis of literature concerning the theme, to analyze them comparatively and he made us comprehend that only then we could reach our aim. Also, he explained us if we knew the methods and approaches, we could go step by step in researching a definite theme with confidence. However, it was only the beginning, he explained, that we shouldn't stop on it, we shouldn't boast of it, on the contrary, it is necessary to work hard and do the best in achieving the goal.

There is one more important thing he said: «It is necessary to note you have seen and heard, because later on it would be late. Or make some copies that would be kept in your drawers. And if that thing wouldn't be necessary for you at the moment, it would turn into a valuable thing for you later».

Let us to say, that our TEACHER, having come to the literature with his poetry, in the 50th he was well known as a literature critic. The researcher wrote 32 books, 1200 articles concerning the different problems of literature study. «Literature and life», «The novel and epoch», «The personality of contemporary in Kazakh prose», «The model of custom», «From legend to novel», «Reflection of ages», «Kazakh historic novel», «A high duty», «A melody of era», «Mukhtar's peak» such monographs and books are known to lots of people.

2. The priest of Turkish people, a great person of Alash - Rakhmankul Berdibay

R. Berdibay wrote a lot of articles, making deep conclusions of the influence of epoch on writer's creativity, about the plot and character traits, about the manner and appearance of a contemporary, about characteristics of genre. The complex works of a researcher such as «An endless wealth», «Pure source», «Epos – the wealth of people», «Folklore tradition», «The problems of Kazakh Turkish epics» were devoted to researching the problems of a rich epos heritage of Kazakh people. It helped to lead an academic researches' writings such as «The problems of Kazakh historic legends», «The truth of folklore», «The history of Kazakh folklore», «Poetics of Kazakh folklore», «The typology of Kazakh folklore» and helped to direct their chapters.

His published works such as "The nightingale of Gulstan", "In a ship of friendship", "From Baikal to Balkan", "The light of the stars" were devoted to the literature, to the spiritual connections and historic roots of relative Turkish people. In the scientist's work "If we want to be a state", the dreams of the people raised bravely.

It in impossible to review in one article the scientific and literary creative works of a researcher who made an enormous contribution to Kazakh literature in the last 50th. Each of his work is equal to one scientific dissertation work and among the invariable principles of scientist's works, we can notice the truth of Islamic region, the friendship of relative people, an anxiety for the future of Kazakh people, a love for Kazakh language. Rakhmankul Berdibay's award "A state award for an enormous work in Turkish world" taken from the president of Turkey for his enormous work in uniting the activity and view, language and religion of Turkish people, had been the proof of our opinion of him.

In «Avrasya Yazarlar Birligi» publication of Turkey, the following was said about the researcher Rakhmankul Berdibay: «He wrote a lot of works concerning important issues of Kazakh Soviet literature. He paid a special attention to kazakh novel and did a deep researches in this sphere. Since 1973 Rakhmankul began to work in the sphere of folklore, doing a deep research works. He is one of the front-rank talented folklorists who was a model

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for a great number of scientists in researching folk literature and through his scientific researches. He created about thirty monographs and more than one thousand scientific articles. Some of his works were translated into tatar, turkish, nogai, uzbek, kyrgyz, turkmenian, russian and english languages. R. Berdibay is one of the writers who wrote "The history of Kazakh literature" in 6 volume.

A master of Kazakh literature and folklore, R. Berdibay took part in a number of scientific-theoretical conferences in the cities as Moscow, Kazan, Ankara, Izmir, Baku, Ashkhabad, Tashkent, Tbilisi, Vilnius, Ufa, Kishinev, Kiev, Minsk, Bishkek, Dushanbe, Tallin, Elista and made reports there.

For 33 years R. Berdibay was a rector of Kazakh folk literature and art university. Being a rector, he hold more than 500 classes concerning the history of Kazakh literature. He wrote a unique and unforgettable works to develop and research old folk music instruments in poetic art of Kazakh nation» the article of such content was published and was given a high evaluation to his scientific works (Avrasya Yazarlar Birligi. 1997). And, his work «From Baikal to Balkan» and other works were translated and interpreted in Turkish language and was published in the edition «Bilik» (Rahmankul, Berdibay. 1997).

R. Berdibay - an academician of the National Science Academy of the republic of Kazakhstan, a member of Turkish language structure (Turkey), a member of International Sh. Aitmatov social academy, a member of National (ecological) academy, a possessor of the awards named after Shokan Ualikhanov of the National Science Academy, "For the honored work in Turkish world". He was awarded with the order of "Parasat", with medals "For the courage in Labour", "Veteran of Labour", with an honourable letter of Kazakh KSR Supreme Council.

He was given the rank of «An honorable worker of the Kazakh KSR Science» (1983), «An honorable culture figure of Kazakhstan» (1992). From 1995 till the end of his life he worked in Khoja Ahmet Yasawi International Kazakh-Turkish University as a professor.

The literature, writing heritage, folklore of Turkish people is considered to be one of the parts of Islamic culture. Turkish people accepted a true Islamic region on their own will from IX-X centuries made a great services to Muslim үмметіне, they strengthened muslim's unity and power all over the world and defended them from Christianity's charge for ages. And, from the side of researching folklore and literature of Turkish people in the time of Islam, the works of an outstanding scientist, professor Rakhmankul Berdibay were enormous. (M. Bulutai. (2008). It is not difficult to notice it from his meaningful writings that proved the closeness of relative people in his work "The light of the stars".

A well-known journalist, interpreter, an author of a number of books, a candidate of philological sciences, a culture figure Orynbek Zholdybay in his work «The Turkish motives of an academician Rakhmankul Berdibay's researches» paid a great attention to the only one direction in an outstanding scientist, nation supporter, an academician Rakhmankul Berdibay's creativity – to the analysis of the works where an interconnection, unity and association of Turkish literature are thoroughly developed. He wrote that the author Rakhmankul Berdibay in his researches made an attempt to choose the kazakh-turkish literary connections and its creative peculiarities, and in the result made a concrete scientific conclusions. The directions of the author's literary – aesthetic researches, its artistic level are also defined. Also, he evaluates: "The name of the supporter of kazakh-turkish literary connections, talented academician Rakhmankul Berdibay is a natural phenomena. The main reason of it is an advanced ideas in his scientific works devoted to kazakh-turkish literary connections» (O.Zholdybai. 2011).

The only person who told that missionary activities, which became popular for the last years, would bring a danger to people's abundance and unity, land integrity was Rakhmankul Berdibay. In his article "The grief of Hazaria" he wrote about the fact that separating into religion would bring a danger to the nation, proving it by the example describing a pitiful fate of Hazaria khaganate (R.Berdibay. 2002). He wrote that one of the way to defend itself from such grief is to revive Islamic region which is a traditional region of Middle Asia and Kazakhstan. He was a man who desires to strengthen the base of Islamic region

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because it was a foundation of humane upbringing that unites the people and force of Turkish nation, that increase an agreement of people.

In M. Bulutay's article called «Kozkamans or about national betrayal and its difference from mankurtism (on materials of the epic "Manas") which was published in newspaper «Cenral Asia» from 14.02.2003 (R.Berdibay. 2003), he dwelled on the content of the Kyrgyz epic "Manas" and described the general motive to Kyrgyz people by the following way: «World famous monument of Kyrgyz people folklore - epic poem "Manas" - tells about hero Manas's feet committed in the name of defending native land and is considered to be an encyclopedia of folk life. In this heroic epic relative to us, Kazakh people, the dramatic events and the echoes of those ordeals through which Kyrgyz people had to pass on their hard long historical path are more detailly described. The content of the poem is not only a chronicle of a bygone era, it also provides an evaluation of the events, philosophical ideas about the world and the meaning of life are disclosed, the poem clearly and vividly narrates about the eternal striving of people for freedom, their hopes and aspirations. Cognitive and educational value of the epic "Manas" is that every time when reading it, the history of the Kyrgyz people is enlivened, a new aspects of the described events are discovered and the veil on the mysteries of the past are disclosed. And, although the poem is not respected the chronological sequence of historical events, in an impressive epic form philosophical generalizations on many issues, wise findings and conclusions, including the value of the set of phenomena of social life, in terms of folk legends found their artistic expression».

In the result of scientific-creative activity lasted for more than half of one century an academician Rakhmankul Berdibay, who opposed the colonizational system of the past with his national spirit and a great scientific-aesthetic potential, wrote 34 books and 1200 articles. Having started his scientific carrer with discoursing the theoretical nature of kazakh novel, our TEACHER left a great deal of work. Having struggled against the unilateralization and memorization in the literature, he fairly evaluated the novel of I.Essenberlin. He analyzed the epic "Abai zholy" not as a genre of the novel but as an aesthetic maturity of general national . We won't be wrong if we'll say that our TEACHER was the one of the very few persons who widen the spiritual scope of the past century. Each the TEACHER's word, each his movements, his findings and conclusions full of anxiety in spirit of nation, generation and people are recreated in our recollection, his works devoted to national literature is a legacy for our generation. If we sincerely worship the instructive life of a man with a great heart full of love to Kazakh people, a man who has a different character full of love and peace, who has a deep sense and intellect, if we keep our TEACHER'S heritage and sincerely feel the duty of serving for the future of nation, for the interest of nation, our conscience will be clear before his spirit.

The humanity of our TEACHER is seen in his sincerity towards to his friends. Pay attention to a condolence letter, which was written after the death of our TEACHER by a great person of Kazakh people Tursynbek Kakishov in the newspaper called "Kazakh literature": "Rakhmankul Berdibayev, Myrzabek Dyissenov and me were close friends. That friendship strengthened in the process of Kazakh literature formation. Rakhmankul was an editor of the first book of the third volume, Myrzabek and me were the editors of the second book. There is no writer who doesn't strive for history?! A number of such writers were close to our director, and made up such sayings: "add us to the number of such writers as Auezov, Mukanov, to the history of literature". So our supervisor Esmagambet Ismailov and we, four of us, opposed to them and conflicted with director and other people. But the book was published. Now there is a ninth volume devoted to that period. It turned into a collection of monographs and portraits. Though it seemed a portrait to each writer it is not a history. Our friendship with Rakhmankul formed at a level of such a big aim and it had continued till this moment.

Now, one of the great contribution of Rakhmankul – a national university devoted to the history and art of Kazakh literature that is near Auezov museum-house. Having led this university for 34 years, Rakhmankul did a great work, writing about men of great talent, who made a contribution to the

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development of Kazakh literature and about phenomena that took place in Kazakh culture in general. For example, he gave me a task to make a report about Kazakh pupils studied in Galiya madrasa, A.Zhiengali, B.Mailin, M.Zhumabaev and other Kazakh great persons, their study and results they achieved. On the basis of that task my historic novels "A bow that made to wander", "A bow" were published. Everything this was thanks to our friendship. Usually, there are different kinds of friendship, but our friendship was a real one. That is why, despite my sickness I am going to Turkistan. Of course, the God would compensate us, who was in friends not according to the benefit somebody brings to you, but according to do good. And there was namely this friendship between me and Rakhmankul. I wish my friend only good in that life" - so he describes his mournful condition in this way (Tursynbek, Kakishov. 2012).

The professor of Kazakh national art university Almas Almatov: "The researchers and musicians such as an academician Akhmet Zhubanov, Alkei Margulan, Auelbek Konyratbay, Rakhmankul Berdibay have researched the stories, legends, kyi and terme and their performers". The role of Literature and Art Institute named after Mukhtar Auezov and a National University led by Rakhmankul Berdibay that was near Auezov museum-house was enormous in keeping the legend traditions and legend heritage. The narrator tradition, poetic and melody art training had begun to realize in this period. Nowadays, we reached the aim in getting a professional specialization by the writers in higher educational schools. We were the first representatives of Kazakh traditional music art who made a contribution in teaching national art in higher educational schools at international level and Middle Asia region level. We were the leaders and authors of the state standard of poetic art specialty. Nowadays, our first students Bekbolat Tileukhanov, Erzhan Kosbarmakov are not only the singers, terme performers, but also persons who have their own point of view in directing socio-cultural development of society. This was, for the first time, performers' recognition from socio-political point of view. Besides that, Ramazan Stamgaziev, Ardak Issataeva, Aigul Kossanova, Serik Zhaksygulov, Ruslan Akhmetov, Maira Sarsenbaeva became a well-known singers-performers. Until these young people had studied and got a special professional specialty our socio-personal place and role were not defined in the society" – he shares with his own opinion (A. Almatov. 2015).

Besides other things, our TEACHER raised great problems since 1950s in press and unsolved problems of today, the problems of "national tradition", "Kazakh language", "Kazakh kindergardens", "Kazakh schools". "…About this he called great persons such as Kalibek Kuanyshbaev, Mukhtar Auezov for discussion". The first person who first raised the problems of national idea, national person, national hero, national religious epic in folklore, national poets, black song, the poets of sobbed epoch, bookish poets, singers poetry, the literature of nogai epoch, general Turkish idea, the history of national music, art of national dance and took part in researching it in science, who brought up pupils and showed them the right way – was Rakhmankul Berdibay. It is well-known to everybody his work in shertpe kui (melody) school. He accepted this sphere as his lifetime goal and work very hard on it. He listed the representatives of shertpe kui (melody) school in all parts of Kazakhstan. He opened shertpe kui (melody) school in conservatoire named after Kurmangazy and namely, Rakhmankul Berdibay was an initiator in agitating the heritage of an ancient tune instruments collected by Bolat Sarybaev. Each nation has such all national idea collectors. But it happens very rarely. And namely, Rakhmankul Berdibay was one of the persons, who has such rare character traits. Rakhmankul's scientific-research and critical works are a different theme to discuss. There are a lot of people who suit his national idea and whom he called to science. I was engaged in literature critic and Rakhmankul made me come to a sphere of science. And it was he, who raised the problem of teaching the Arabic language in Kazakhstan. And it was again Rakhmankul Berdibay, who raised the problem of nation freedom. I think his views on national interest in Kazakh spiritual history would do a lot of good to our generation.

If we go over the centuries of our national spirituality, there a lot of gifted persons, talented researchers who work hard and left their marks in

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literature history. One of them was a great researcher Rakhmankul Berdibaev. Having done a productive work in the group of great persons for a long time, he, an outstanding reseacher showed us the model of leaving an immortal mark in our spiritual culture. First of all, Rakhmankul thoroughly investigated a large genre of Kazakh literature – a genre of novel. Also, he participated in turning the Kazakh music art and national kobyz performers into a national welfare. If to name, such kobyz performers as Ykylas, Sugir and Tolegen Mombekov turned into his object of research (Tursyn, Zhurtbai. 2011).

In his article "Rakhmankul was a priest of his nation, a fame of Alash" published in newspaper "Zamana" Serikkazy Korabay wrote about Rakhmankul Berdibay's fidelity to Turkish people, and describes that he was a man of a good sense in the following way: «In 1984 when I was a senior laboratory assistant in Literature and art institute of the national science academy named after M.O.Auezov where Rakhmankul ascended to the top of the science. It was the beginning of November. A talented folklore scientist Bolatzhan Abylkassymov who was an academic secretary of this institute for about 10 years, called me and informed that in a few days a folklore researcher, professor from Turkey Phikret Turkmen would be coming and that we should meet him. He asked me to go there with him.

In our institute Rakhmankul Berdibay knew this Turkish scientist very well. Bolatzhan considered it would be good not to bother an elder man. The plane is planned to land in the very morning. May be this was the reason of it.

We came to the airport. Suddenly, an enormous body of Rakhmankul Berdibay appeared from one side of the airport. Bolatzhan rushed about him and said: «Oh, Rakhmankul! You've come here too!» – and Rakhmankul said: «I know Phikret very well. It would be good to meet him for me too». Bolatzhan was very glad to see his scientist brother. We had a long talk. Bolatzhan looked at his watch and run toward to an inquiry desk. I didn't know what to say to elder scientist. At this moment Rakhmankul: «Seyit brought you to ths academy, didn't he? Generally speaking, you'd better work in our department. I know that you've investigated the folklore for a long time. You'd better say me about it. We would find you a vacancy here», - and continued: «Hava a good luck! Don't forget about folklore!» - and wished me well. It was the truth that an outstanding scientist Serik Kaskabassov was my additional supervisor of my diploma work in the university and he brought me to the science. But, because of lack of the vacancies in folklore department led by Rakhmankul, I came to work at the department of history of Kazakh literature. Nevertheless, I was very happy to hear good wishes from this famous scientist whom before I know only from outside.

We met our guest who came from far country. They embraced very warmly with Rakhmankul as if they were friends for a long time. This warm meeting proved that Rakhmankul was a faithful friend, and the main thing, it was evident that he was faithful towards to brotherhood with Turkish people despite the soviet cold policy. A short dialogue that was between us at the airport was a meaningful lesson for me. It reminded me a scientist's shape who struggled for today and future of nation, who reflected a general Turkish dream in all his researches and who aimed at uniting goal of Turkish people.

In 1986 during the Zheltoksan battle Rakhmankul didn't give up with his energy characteristic to a fighter. He didn't step back. He stood up for the young people who opposed the soviet system and supported their actions, telling it at collegiate meetings, at the lessons in the Almaty Kazakh literature and art national university which was led by him for about 30 years, he frankly reproached the order of slander that was laid on the whole nation by the Kremlin. To think of the interest of the native land, to be sick at heart for the fate of nation was the main principle of scientist formed since his childhood.

He never lost his struggling character trait for the future of his nation. Rakhmankul always told about Alash figures, the white sides of nation history while we were in my study when I had been working as an academic secretary in the institute, and I distinctly remember from our teacher and heard for the first time about an adventural life of an outstanding statesman Sultanbek Kozhanov who fairly served for

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his nation, bravely opposing a formidable leader of the Soviet empire Stalin.

Rakhmankul was such a nationalist, a scientist struggle in a Turkish spirit. May this Turkish spirit stimulated him when he was invited to the Khoja Akhmed Yassawi university, without hesitating he tidied up all his affairs in Almaty and moved to Turkistan. He didn't have a short rest here too. With a new inspiration and vigorous desire he did a lot of work and wrote a number of articles about common values of Turkish properties, having established close ties with Turkey, Turkic language countries, he had close relations with colleague scientists. He achieved his goal by opening a dissertation council on conferring a degree of candidate of philological sciences in the residence of Khoja Akhmed Yassawi university which had turned into a sacred spiritual centre of the young researchers of Turkic countries, and he was a chairman of this council. It is known that for about eight years this council had a fruitful work on graduating candidates of science on different themes necessary for the history of literature for the south-west region» (S. Korabai. 2013).

Our TEACHER made an enormous contribution to the development of national, spiritual culture. In this regard, a university of people opened near a museum-house named after a great writer, academician Mukhtar Auezov brought a benefit to people. An outstanding scientist's merit and invaluable work would remain as an immortal model and a kind heritage. And his name would remain in a people's heart

A monumental researcher, a prominent teacher, who didn't loose his courteous look in life, a figure who sincerely loved his nation, a figure born for his country and nation, a scientist struggler who devoted his whole life for the idea of uniting Turkic people, an outstanding person of Turkish world, an academician Rakhmankul Berdibay's name and his kind act would be kept in the heart of our generation, in the heart of our nation.

3. Rakhmankul Berdibay and a folklore tradition in Turkistan region

A city of Turkistan was a spiritual centre of Turkic people for ages and at the same time it is a truth that it was a centre of humanism. Also, "…it took a large place in the heart and mind of people as a sacred image. The history of Turkistan had entered the heart and memory of people and became a product for a great deal of marvelous fiction" (B. Korganbekov. 2001).

The importance of folklore tradition research in Turkistan region assist to acquire the peculiarities and character of narrator schools grouped in this region more deeply. There were a lot of talented persons who, all day long, sang an extensional songs in the city rich of historic events. The research of the problems of their creativity and repertoire gives a great deal of information concerning this city. We may proudly tell about the persons who founded the art school in this region, who nourished the people with different ethic songs – Maikot, Kulynshak, Molda Mussa, A.Baitursynov, S.Akkozhaev.

The peculiarity of the narrator school in this region is a special spreading of a valorous epic models. They say the main reason of it that the south region had been a trade, caravan way for a long tome, also it turned into a centre of great battles. Gun, ogyz, karluks, then kypshaks and mongols made a number of wars, different social transitions and changes (E. Ismailov. 1956). A researcher B.Korganbekov says that in the South Kazakhstan the influence of ogyz, kypshak epoch's wars (XIV-XV) are more evident in comparison with the epic models (R. Berdibay. 1980). Nevertheless, there were a lot of historical events influenced on the epic models in Turkistan region, its influence on the artistic structures and content of a number of songs is also evident.

We may say that eastern epics and religious epics among them were characteristics of folklore school in Turkistan and they spread widely. The main reason of it is that this city was a large centre of religion and there were a lot of kozha families. «There were a lot of folklorists sang eastern epics. Shadi Zhangiruly, Zulpykhar Balgabaev, Aitbai Belgibaev and others, folklorists always sang the epics as «Shakir-Shakirat», «Mournful Seyil», «In the desert of Kerbala», «Shyryn-sheker» (R. Berdibay. 1999). The research of characteristics of the epics in the eastern subjects from the folklorists' repertoire and the secrets of their spreading are actual problems.

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Folklore art is a sacred art. Remembering folklore heritage, observation of creativity biography and psychological peculiarities of talented persons is going to be investigated. Undoubtedly, a fascinating researchs will tale place. S.Akkozhaev's folkloric, singing art proves that he was not ordinary and rather peculiar person. Also, the repertoire policy of folklorists, a psychological mix between interlocutor's mood and stories in epic reveals this region's realistic energy. It is not characteristic only to Sultanbek but also to all other folklorists. That is why, the level of creativity of folklorist who hadn't any repertoire policy wasn't seen thoroughly.

The research of creative personality and practice, gifted specificity and being of each folklorist in Turkistan region gives a possibility to investigate thoroughly the actual problems common for the supporters of national heritage. That's why, such problems as "The tradition and novelty in epic narration, the role of folklorist, the place and number of formulae, the artistic tools of folklore, the sphere of epic spreading, folklore schools, national peculiarities and internationalistic characteristics, the essence of interlocutor's social world" (Kazak Soviet Encyclopediasy. 1979) were important in observing the folklore tradition.

4. The image of representative of folklore tradition – Sultanbek Akkozhaev in creations of R. Berdibay

Saving the heritage of nation's oral folklore and research of folklorists' biography and their creativity peculiarities who deliver it from generation to generation is one of the most interesting themes. Their place in developing a pure lively word welfare, in raising epic to high ideological-artistic level is great enough. One of the persons who brought us such peculiar model of folklore art with a great creativity is Sultanbek Akkozhaev

S. Akkozhaev was born in 1876 in Akmola province in the village of Kulanotpes. When he was young he moved to Turkistan region of the South Kazakhstan and he lived in Karatau till his death.

Sultanbek was inclined to folklore since his childhood. In one of his songs folklorist says that Kulynshak Kemeluly was his first teacher. In Kazakh Soviet Encyclopedia it was written "Sultanbek Akkozhaev went along with poets as Kulynshak, Mailykozha, Molda Mussa, Maikot and sang their songs (R. Berdibay. 1980). His composition of repertoire songs was very rich and he learnt by heart for about 20 songs. In his book "Folklore tradition", it was mentioned that he knew the following folk songs: "Alpamys", "Kyz-Zhibek", "Shora batyr", "Kobylandy batyr", "Trade - Ishan", "Nauryzbai khanshaim".

About his own impressions, the scientist R. Berdibay says: "We were surprised how he managed to learnt by heart a great number of songs while we listened to Sultanbek's and other folklorists' songs. It turned out that this is one of peculiar traits of such talented persons to learn by heart terme, tolgau, proverbs and sayings, shezhire and others" (R. Berdibay. 1980).

The scientist listened to the folklorist's songs in the hard years of the Great War. That time Sultanbek was a stooping sixty years old man of short height. He sang songs between Randysai and Andysai mine in the mountain of Karatau, riding a horse and taking a dombyra into his hands. «Having learnt the people's desire, folklorist Sultanbek starts to go ahead as a quick horse. Each of his songs were sung by him in different style. According to the direction of the situation, meaning, changes and folklorist's inspiration, the rhythm of the song quickly changes, sometimes it raises, sometimes it falls down. In each part of the song the stress of the song and the changes of the tune don't bother the interlocutor, the phenomena get interested the people, stimulate and encourage the people» (R. Berdibay. 1980).

Sultanbek was very talented, gifted person. An inclination towards to several types of art was noticed in his long creative life. Sultanbek's performance propagandizing songs about political events proves that he was a person of a high nature. For example: He sang a number of his songs before body of electors in Shymkent oblast, in the region of Sozak, in the villiage of Karabulak in 1937 on the 12th of December.

One of the traits of folklorist – his possession of the art of kyi. The melodies of tokpe kyi and shertpe kyi were very marvellous in his creative works. Especially, sad motives come to his mind when he began to sing such long songs. When Sultanbek didn't sing songs first he explained the content of

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certain songs» (R. Berdibay. 1980). The place of such kyis as "Ak zhelek", "Ala buka" was special among other often used songs.

One of the peculiarities of S. Akkozhaev's art is they were fabulous, fantastic. Though it was difficult to revive the content of the events, to explain historical meaning to public Sultanbek had a great ability to tell fairy-tales artificially. Within cognitional and educational meaning of the stories «Intellect and happiness», «The story of Oraz molda», they are valuable with its influence on people's memory.

Sultanbek had a repertoire policy full of deep thought. Within the psychological correspondences occurring through the influence on interlocuter's mood are an aesthetic category, they improve the realistic power of art. For example: a severe battle of Kazakh people with its enemy in the epic «Alpamys batyr», the events where Alpamys revenged the enemy and came back to his people, though he was tormented, Alpamys's fate reminded them the condition of their brothers who went to the battle with german conquerors. And, if the interlocutors admired Kyz Zhybek's wisdom in «Kyz Zhybek» song, the rudeness and boastfulness of Koren was ridiculous to them. The hatred of the public towards to the image of kalmak khan was close to their revengeful feelings to fascist's conquerors and made them be satisfied with the enemy's defeat in the epic.

Th researcher R. Berdibay about melody problems of Kazakh folklore said: «Kazakh folklorist sang songs with the help of dombyra, or with accordion, or with kobyz. So the poetry and music find a harmony here. After that, the folklore turns into a peculiar valuable kind of art» (R. Berdibay. 1980). The melody of Sultanbek remained in everybody's memory. Within his beautiful voice, an ability to sing a song, he had a good manner to attract everybody's attention. While he perfomed the models of epic at the instance of audience, at the moment the people get tired, he immediately changes his voice to entertain them. This is also one of his inimitable, unique traits.

The research of regularities of Kazakh people's great heritage making, saving and spreading depend on the development and promotion of folklore art by creative perons. When the people had a great desire to know the features of historic events, of course it would increase the repertoire of the folklorist. That is why, the people's attraction will influence to the prosperity of epic songs. It's necessary to remember these problems when to say the peculiarities of theme and idea of the songs from S. Akkozhaev's repertoire.

We had told only one page of S. Akkozhaev's way of life and creative features. The research of his repertoire policy would give an information about general creative secrets and an individual perfoming skills to a lot of singers and folklorists. Also, it is undoubtful that saving an epic folklore, promoting and developing it would give a concrete decisions to scientific problems.

5. Conclusion

Turkistan had turned not into a symbol of Turkic people's unity but also to the spiritual capital of Turkic world. The historical role of Turkistan in forming it as a country of Turkic people and a nation of Kazakh people is great enough. There were a lot of talented persons and figures born in this place and who were famous for all over the Turkic world.

One of these great persons was Rakhmankul Berdibay, his works in Kazakh literature and culture, in the sphere of turkology made him not only famous but also include him to an outstanding scientists' row of Kazakhstan science; raised him to the level of veteran person who can easily speak on the part of people.

Sheriff Aktash who interpreted the works of scientist in Turkish language valued the scientist's works in the following way: «The work «From Baikal to Balkan» – is the work that united the whole Asian people, the fuit of the national sensitiveness and conscious attention in wide meaning».

The main theme of this work – Turkic world, the unity of Turkic people, the fate of Turkic people, a common literary heritage of Turkic people, the main goals of uniting Turkic people. The work of R. Berdibay «From Baikal to Balkan» is similar to reflections about Turkic people's past and today and bright future. In the period of Soviet government a lot of nationalists were accused and driven out, though one of panturkism ideologists Gasprinsky was dedicated to Nobel prize for strengthening the friendship between the people he was blamed as

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"the enemy of people" sometimes such unpleasant negative events come to our mind. In the 50s a prominent scientist Rakhmankul Berdibay came to literature sphere, he made an enormous contribution in developing crititc sphere, especially, in researching the ways of developing kazakh novel, he showed a wonderful model of observing Kazakh folklore with new views, he could skillfully describe the problems concerning the nation development, taking an active part in the society, in the art of literature. A well known poet Muzafar Alimbaev describes great abilities in the following way: «In order to defend and support Kazakh nation, the whole Turkic people and to spread it to all people the scientist went through a long and hard trial in his difficult life in the world of literature». Geberally, R. Berdibay created more than ten scientific-cognitive books and manuals, more than thousand scientific articles concerning Kazakh-turkish literary connections. He became a well known researcher and folklorist in the field of comparative literature thanks to his these wonderful works. These literary-aesthetic creations that interested all the audience by its quantity and quality found their own place in the study of literature. Having been born and grown up in Turkistan region, having inherited all merits of this place, having been at the top of Kazakh-turkish spiritual world, having taken a name of this modern period "An ancestor Korkyt" Rakhmankul Berdibay, nowadays, is one of the great persons of Turkistan.

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A Study on the Hydrochemistry of Tapti river at Multai, Betul District of M.P.

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ABSTRACT
In this paper effect of seasonal and anthropogenic activities on water quality of Tapti river is discussed. For this purpose, origin place of Tapti river at Multai was selected after joining sewage canal as Sampling Station. Water samples were collected during pre monsoon, monsoon and post monsoon seasons for the year 2014 at monthly bases.

Physicochemical parameters like Temperature, pH, Conductivity, Alkalinity, Total hardness, BOD, COD, DO were analyzed as per standard methods recommended by APHA, WHO. The observed values were compared with standard limits. During the seasonal course major changes observed in these properties resulting that level of water pollution increases due to anthropogenic activities.

INTRODUCTION

Tapti also spelled as Tapi is a river in central india, rising in the Gwailgarh hill of the central deccan plateau in south central Madhya Pradesh. Multai city named as it is the origin of river tapti. Rivers are one of the most important sources of water but there pollution due to anthropogenic activities has created a major global problems. Rivers are life line of civilization. Water pollution due to sewage and industrial waste discharge into the rivers now become a threat to the ecosystem (Bajpai *et al.,* 2002). The main objectives of the study are to assess the water quality of river Tapti at its origin place at Multai.

Materials and methods –

Water samples were collected from sampling station at Multai during the year 2014. Seasonal values were taken as the average value of the four months for pre monsoon, monsoon and post monsoon seasons. For analyses of water samples standard methods recommended by APHA , WHO, (1984) and ICMR, (1975) were adopted.

Observation –

S.No	Parameters	Pre monsoon	monsoon	Post monsoon
1.	Temperature (˚C)	30	28	27
2.	pH	6.40	7.80	7.80
3.	Conductivity (µ mhos/cm)	2.10	2.40	2.10
4.	Alkalinity (mg / l)	150	135	138
5.	Total hardness (mg / l)	100	80	90
6.	BOD (mg / l)	5.70	3.20	5.10
7.	COD (mg / l)	8.80	4.80	6.00
8.	DO (mg / l)	3.80	6.50	5.10

Results and Discussion –

The results of this work have been shown in Table No- 1. These data revealed that the water of Tapti river at Multai is deteriorating due to sewage canal of the city .Water temperature of river water was ranged from 27(˚C) to 30(˚C) . Continuous rise in temperature recorded during pre monsoon season and lower value of temperature recorded during post monsoon season. Similar view were expressed

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by Murgesan et al. (2004). pH of water governs water quality of any aquatic ecosystem. The pH of river water ranged from 6.40 to 7.80. The minimum pH value was observed during pre monsoon season. Conductivity of water shows dissolved salts in water. The range of conductivity was observed from 2.10 to 2.40 during the study period. The values of DO, BOD and COD were found to vary from 3.80 mg/l to 6.50 mg/l, 3.20 mg/l to 5.70 mg/l and 4.80mg/l to 8.80mg/l respectively. The DO plays important role in distribution of aquatic organisms. The value ranged from 3.80 mg/l to 6.50 mg/l during the study period. The higher value of DO were noted during monsoon season.It indicates lower level of water pollution. The BOD & COD are helpful to know the pollution level of water (Rajkumar et al., 2003).

Hardness of water increases due to mixing of domestic waste water as reported by Goyal et al. (2006). The total hardness of water sample ranged from 80 mg/l to 100mg/l during the study period. Alkalinity of water ranged from 138mg/l to 150mg/l during the year 2014. Higher value of alkalinity was observed during pre monsoon seasons.

From the analyses of study on the hydrochemistry of Tapti river at Multai, Betul District of M.P. it is clear that the anthropogenic activities are responsible for Tapti river water pollution at Multai, District- Betul of M.P.

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Situating Privatization in the Context of Higher Education in India

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ABSTRACT
Education is considered as the backbone of the development process of a society. The higher education further adds value to the developmental process of the society. It helps in making individuals capable to explore better life chances and improved means of resources for sustenance through a dynamic process of creation, upliftment, and dissemination of knowledge. In a fast developing country like India, the role of higher education assumes utmost importance in aligning efforts and outputs for better life conditions of masses. Our higher education system has had a glorious past in the form of excellent universities like Nalanda, Vikramsila, and Taxila, which attracted students and intellectuals from all over the world those days. However, in the present time we are lagging far behind in terms of qualitative education and research. This necessitates a serious concern and introspection to look into the nuances and flaws of our system that make our higher education system stand at where it is now. This paper discusses some of the issues, which are at the core of the main concerns pertaining to higher education in India. Taking a snapshot of the present status of availability of institutions and students' enrolment therein, advent of higher education institutions in India, and their impact on the overall academic structure of country, this paper attempts to delineate the nuances of higher education system in India and points out some most relevant concerns troubling the issue at the core.

INTRODUCTION

Education and development go hand in hand in any society across the globe. Irrespective of the geographical references and locations, education is perceived as the under-current of the national development in any country. It is a powerful tool to build knowledge-based society in the 21st century. In a fast progressing country like India, improvement of access along with equity and excellence, adoption of states-specific strategies enhancing the relevance of higher education through curriculum reforms, vocational education, information technology, networking, and distance education are some of the main policy initiatives of the higher education sector being talked about in the last few years. In the last couple of years, emphasis has been laid on expansion with equity, use of ICT and promotion of quality education. Rapid technological advancement and adoption of liberalization, privatization, and globalization have brought the higher education into an era full of challenges and prospects. Growing demand of accessibility to Higher Education lays huge infusion of funds on Government but during the last two decades, there is a growing trend of Governmental withdrawal from the education sector, especially from higher education sector. This has culminated into exponential increase of private sectors in higher education and Public Private Partnership (PPP) in order to bridge the gap between demand & supply. On the other side, it seems that quality is not keeping pace with quantity. Quality cannot come only with investment of funds and developing infrastructure by the private funding but quality of consciousness, resource mobilization through Public Private Partnership and its proper management are keys to quality in Higher Education. Government of India has been working on formulation and implementation of various plans and strategies to revamp the current educational system

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and make it more relevant to the needs of society. In this regard, Rashtriya Uchchatar Shiksha Abhiyan (RUSA), Foreign Education Providers (FEP) Bill, Special Education Zone (SEZ), restructuring of U.G.C., NCTE & AICTE are some of the steps that Govt. has been pursuing of late.

Expansion of Universities in India

At the time of independence, India had only 20 Universities and 500 Colleges with 210,000 students enrolled in higher education institutions. However, the post-independent India has witnessed a phenomenal increase in terms of academic facilities compared to what was there at the time of independence. And the last two decades have proven to be phenomenal in terms of quantitative growth of academic institutions in India across States. Today, there are 45 Central Universities, 312 State Universities, 129 deemed to be Universities, and 173 Private Universities (as on 05-02-2014) in India. This exponential growth of higher education system in India seems to project an optimistic picture of the higher education in country, however there are variations in terms of distribution of colleges, institutions, and universities across states in country.

The following **Table-1** presents a factual detail of number of colleges per State / Union Territory as well as that per lakh of the population of age group of 18 – 23 years. Also, average enrolment per college has been included in the fact-sheet.

Table 1. Number of College per Lakh Population(18-23 Years), Average Enrolment per College

Sl. No	STATES /UTs	No. of College	College per lakh population	Average Enrolment per College	Sl. No	STATES /UTs	No. of College	College per lakh population	Average Enrolment per College
1	Andaman & Nicobar Islands	6	14	489	19	Lakshadweep	0	0	
2	Andhra Pradesh	4814	48	491	20	Madhya Pradesh	2061	24	609
3	Arunachal Pradesh	26	16	1731	21	Maharashtra	4603	34	685
4	Assam	485	13	963	22	Manipur	79	26	1528
5	Bihar	649	6	1852	23	Meghalaya	61	17	943
6	Chandigarh	27	19	1433	24	Mizoram	29	22	586
7	Chhatisgarh	530	18	506	25	Nagaland	57	22	486
8	Dadra & Nagar Haveli	4	8	518	26	Odisha	1089	23	611
9	Daman & Diu	5	11	196	27	Puducherry	83	64	454
10	Delhi	184	9	1249	28	Punjab	973	28	717
11	Goa	49	32	602	29	Rajasthan	2652	32	695
12	Gujarat	1805	25	594	30	Sikkim	11	14	910
13	Haryana	1055	33	815	31	Tamil Nadu	2309	30	774
14	Himachal Pradesh	296	38	542	32	Tripura	39	9	973
15	Jammu and Kashmir	307	21	1345	33	Uttar Pradesh	4849	20	1124
16	Jharkhand	234	7	2344	34	Uttarakhand	395	32	1058
17	Karnataka	3281	44	389	35	West Bengal	899	8	1439
18	Kerala	962	30	559		**All India**	**34908**	25	**707**

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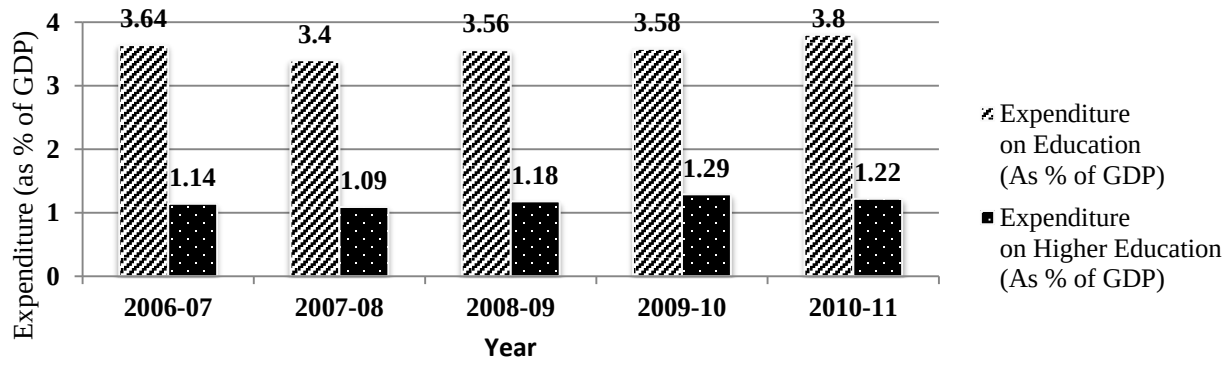
The data given in **Table-1** presents the skewed state of higher education opportunities available to the masses in India across states. On the one hand we have States like Haryana, Himachal Pradesh, Karnataka and Puducherry, where numbers of colleges per lakh population (18-23 years) are 33, 38, 44 and 64 respectively. On the other hand, we have States like Bihar, Jharkhand and West Bengal, where numbers of colleges per lakh of population (18-23 years) are 6, 7, and 8 respectively. With such dismal and skewed state of educational opportunities available to the masses, it is very difficult to think of a uniform and standardized system of higher education. The reason of this skewness could be attributed to the Governmental steady withdrawal from the education sector and a boom of privatization in higher education. Obviously the private players in higher education sector concentrate on setting up and running institutions where they see better income prospects and financial gains. This has resulted into a transformation of welfare oriented education system to the one minting money.

Public Expenditure on Higher Education in India

The debate about 'what percentage of GDP should be spent on education?' has been sort of unending in the Indian context. The Education Commission of 1964-66, popularly known as Kothari Commission, had recommended that the Govt. should provide for expenditure of 6 % of the GDP (Gross Domestic Product) on education, in order to make the system competing with the global counterparts. Unfortunately, it has never been so that the expenditure on education might be planned in accordance with what the Kothari Commission recommended. A look at the budget expenditure on education in the recent years presents the following picture:

Figure 1: Expenditure on Higher Education in India (as % of GDP)



As presented graphically here, we can see that the total expenditure on education as a percentage of GDP has been 3.64 % in year 2006-07 to 3.8 in year 2010-11. And the higher education sector receives the residual of the budgetary provision as evident from the facts presented here. In Year 2006-07, 1.14 percentage of GDP was provided for higher education; in Year 2007-08, it was 1.09 %; in Year 2008-09, the figure was 1.18 %. Years 2009-10 & 2010-11 too were not different from the previous years with a provision of 1.29 % and 1.22 % of GDP to be specified for higher education.

With such a state of half-hearted systemic support and poor financial allocation from Government, nothing much can be expected as outcome. However, the arithmetic detail of expansion in higher education in India presents a substantial growth pattern of higher education. This is because of the fact that in order to cover up the Governmental retreat from higher education, private players have been given free hand to set up educational institutions at all levels. Of course, there has been increase in license and permit

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system, in the forms of various regulatory authorities,that have induced more dilution than doing any good for the betterment of the system. This has had a direct bearing on the quality of higher education system.

Privatization of Higher Education in India

In India, privatization of education has been a phenomenon prevalent from the old time, even before the independence. However, it was more in the case of school education than in higher education. There has been a unique difference between privatization issues of school education and higher education in India. Private schools have been and still are considered as meant for the rich and affluent people and have been performing on a better scale, whereas private higher education institutions have not been able to come at par with their mainstream counterparts so far. Despite the fact that many higher education institutions being run directly by the Government or supported by Govt. are not doing good, the fact holds true that private higher education institutions have still a long way to go to prove to be at par with some of the prominent Government funded higher education institutions. This has another important factor to be explained as a reason. Though, education services in India are considered as not-for-profit sector, still in practice the private education institutions are exclusively set up for profit sake, with hardly a few exemptions to cite as example. With profit centric approach, these private education institutions compromise with quality of faculty, academic infrastructure and services. That subsequently leads to dilution in terms of academic and scholastic output of students.

According to the National Sample Survey data, the government's share in overall education expenditure has been declining steadily. For states like Kerala, the decline is steep, from 75 to 48 percent, while for Madhya Pradesh it is from 84 percent to 68 percent. Indeed, while private expenditure on education has risen 10.8 times in the recent years, that for the poor rose even faster, by 12.4 times. Many students, who formally enroll in publicly funded colleges and universities, barely attend classes there. Instead, they pay considerable sums to the burgeoning private sector vocational IT training firms and other job oriented courses which are mainly under the domain of private institutions.

However, the most noticeable trend has been the transformation in the provision of professional education, especially engineering, medicine and business schools. In the case of engineering colleges, the private sector, which accounted for just 15 percent of the seats in 1960, now accounts for over 86 percent of seats. Ninety percent of Business schools in India are in private sectors. Similar is the case of Teacher education Institutions in India. The percentage of medical colleges in private sectors is still less than the percentage of engineering and management institutions in private sector. However, their percentage too is increasing.

Advent of Private Universities in India

A recent phenomenon of privatization in higher education is accelerated advent of private universities in India. Earlier it was perceived that private universities needed approval from the UGC. However, in year 2002, Government in Chhattisgarh State of India paid put to that assumption. It saw a regulatory loophole and enacted the Private University Act in 2002. One hundred and eight such universities came up in the state, with 94 in the state capital, Raipur, alone. After a new government came to power, it passed the Private University Amendment Bill, 2004 under which proprietors of all private universities would have to deposit Rs 2 crore with the government and prove that they have 25 acres of land for their institutions. The UGC also came up with the UGC (Establishment of and Maintenance of Standards in Private Universities) Regulations 2003;according to which, each private university would now require a separate State Act conforming to the relevant provisions of the UGC Act. However, the private universities, so set up, have been using various regulatory loopholes as well as advantage of Governmental lax monitoring on the functioning of such universities, to their own

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undue benefits. Many private universities have been running off campus centers, even outside the states where these universities exist, to increase enrolments and thus increase their revenue. This is a clear violation of the private university act as incorporated by the U.G.C. Many other private universities are adopting different ways to increase enrolments and earn money. This has a bearing on the quality of education being imparted through these institutions.

Though, the new UGC regulations try to curb these loopholes as well. A university set up under a State Act shall operate "ordinarily within the boundary of the State concerned," and can only open off-campus centers (outside the home State), off-shore (abroad) centers and study centers only "after the development of main campus … and after five years of coming into existence." Even then, it would require the prior permission of the UGC and the Government of the host State, and such approval would be forthcoming "in exceptional circumstances" that are unspecified. On the other hand, the admission, fee structure and programs of study of the private university will be have to conform to the norms and regulations prescribed by the UGC and other statutory bodies. However, the actual impact or the bypassing of this provision has yet to be seen in the time to come.

Deemed Universities

Another case is of the Deemed Universities in India. A Deemed University is a single institution, which is empowered to confer its own educational degrees to its graduating students. These Deemed Universities have a legal status equal to that of a University, and as per University Grants Commission rules, are allowed to have the word "University" in their name if they so desire. At present there are 129 deemed universities in India. Some of them are Government funded and a majority of them are private funded and managed institutions. On the one hand, there are some very good and prestigious Government funded and even private funded and managed deemed universities which have earned accolades for their contribution in imparting quality education and adding value to the national development, whereas there are a few which have not been able to do justice with the basic spirit with which those institutions were granted the status of deemed university. In the wake of the rapid expansion of the deemed to be universities in recentyears, there have been serious public concerns relating to their quality, performance and practices. The Ministry of Human Resource Development (MHRD) of Govt. of India constitutes a committee, known as Tandon Committee, to review the functioning of the existing institutions 'deemed to be universities' with wide-rangingmandate "to ascertain whether they are indeed serving the purposes for which they were so declared and whether they are complying with the conditions, if any, mentioned in the notification by the Central Government in each case". Concurrently, the Ministry of Human Resource Development, Government of India directed UGC to take up review of the functioning of all the deemed to be universities with respect to maintenance of standards especially with regard to the availability of qualified faculty and the infrastructure in the deemed to be universities. The Tandon committee came up with its report in which the deemed universities have been categorized under various categories based on their performances and recommended dissolving of as many as 44 deemed universities. This recommendation has been challenged by the stakeholders and the matter is sub judice now.

Conclusion

The global scenario and tough competitive international environment plays a crucial role in shaping the education system of India. The governmental efforts in making and shaping educational system are the most desired thing that one can expect from those who are at the helm of the affair. The increasing population and their subsequent pressure on the education sector pose genuine demand of education, especially higher education. Moreover, to meet such demands, the country needs higher education institutions in adequate number to meet the demand of the

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people. However, the role of government does not get relinquished by handing over the sector to the private managements. The regulatory authorities do exist but their monitoring needs to be transparent and impartial. Only then the rule of law can prevail and we can hope for a better education system imparting quality education to the students. The success of higher education system is not only dependent on the number of enrolment or revenue that it generates, but also it manifests in the form of the career trajectories of its students; quality of research works and its extension for the larger interests of the masses; value addition in the reservoir of knowledge; and an overall social environment full of opportunities and just life chances for the members of the society.

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"ANALYSIS OF POWER QUALITY DISTURBANCE DUE TO VOLTAGE SAG ON 11 KV NETWORK "

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ABSTRACT
Nowadays consumers are not only concerned about continuous power supply but also about the quality of power supply. In today's advanced world, where people are using so many sensitive equipments power quality plays a vital role. Power quality can be disturbed due to many reasons. Voltage sag is one of these reasons. It is also termed as voltage dip. Basically characterization of voltage sag is done on the basis of magnitude, duration and also on phase angle jump of voltage. In this paper, voltage sag detection is done by calculating RMS voltage for faults like single phase to ground fault, phase to phase fault and two phase to ground fault. For this M.P Power Transmission Company Ltd. Nayagaon , Jabalpur is taken as a case study. Software used to calculate out this voltage sag is MATLAB/ SIMULINK.

.1. INTRODUCTION

The term Power Quality has come as a subject of concern in recent years. Due to day to day increase in applications of different types of electronic equipments and also distributed generation , the term Power Quality has got highlighted. It is observed during fault conditions, lightening strikes and adverse conditions which affect the system voltage. The main issues which affected the distributed generation are harmonics, voltage regulation, sustained interruption. Apart from all these, one of the other reasons which is going to discuss is voltage sag.

VOLTAGE SAG arises due to power system faults. It disturbs the stability of the voltage in the system, resulting in poor power quality. Voltage sag is also known as voltage dip, It severely affects the voltage profile of the system. It is one of the important cause of power quality disturbance affecting industrial as well as commercial customers. Probability of small voltage sag is more as compare to that of large voltage sag. This is due to configuration of electrical supply.(5) Clearing out of voltage sag or say regain of the system stability depends on the fault clearing devices connected in the system. Voltage sag always compared with the interruptions but there are substantial differences between the two. Voltage interruption occurs for time period not greater than 1 minute. Interruption are decrease in RMS voltage to less than 10% of its nominal value. They even cause complete blackout for small or long period of time depending on the fault clearing action taken, and also deteriorate the system quality. RMS is the qualitative quantity which is proved to be very helpful in describing the details of the power system. Basically RMS is a periodic signal which can be used to fetch out disturbance measurement

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which are non-periodic in nature. Monitoring of power quality is done by collecting data concerning voltage and current and utilize that data to get the information regarding stability of the power system.(2)

In this dissertation work analysis of voltage sag is done on 33/11kv distribution substation of MPEB feeding Shakti Nagar. By calculating the RMS values voltage sag measurement has been done. The whole system is modeled by using MATLAB simulation.

1.1 VOLTAGE SAG AND ITS EFFECT

Voltage sag or dip occurs for very short duration say about 0.5 to 30 cycles. It is due to decrease in RMS value of voltage of about 90% to 10% of nominal voltage of power frequency. It severely effect on several sensitive equipment such as adjustable speed drives, programmable logic controllers, process control equipment, computers, robotics and also diagnostic systems. Many a times voltage sag is mixed up with the term interruption but there are certain remarkable differences between these two terms. Voltage sag does not cause severe damage to consumer as in the case of interruption but it can lead to deterioration of the system resulting shortage of life time of the sensitive equipment. Sag is experienced by low voltage consumer more as compared to other although sag is distributed in the whole system.(3) This is due to network characteristic features, sag in some part of the power system is shallow or even negligible. Voltage sag results in production loss, plant breakdown, increase in maintenance cost.

Problems arises due to voltage sag are

1. Poor performance of equipments.

2.Increased system losses.

3. Increased reactive power requirement.

4. Uneconomical

5. Poor power quality : customer dissatisfaction

The economical consequences which is faced by industrial customers due to voltage sag can be estimated by adding the cost of frequent reparation and the cost associated with the loss of production.(4)

1.2 CAUSES OF VOLTAGE SAG

Voltage sag is reduction in RMS value of voltage for short period of time. Short circuit is the main cause of voltage sag. Causes of voltage sag on utility as well as on end user side are as follows.

Voltage sag caused by utility side are due to switching on and off of equipment by the use of circuit breakers, disconnection switches or reclosure. Natural causes such as lightning strikes, car hitting power pole, tree and animal touching power line etc. Faults on utility side are categorized by single phase to ground fault , phase to phase fault , three phase to ground faults. Among all these, single phase events which occur because of the fault between phase and the ground are most commonly seen as the cause of voltage sag.

Sag caused from end user side due to use of non-linear load, starting of big motors which require large amount of current to perform its operation, which results in sinusoidal waveform of voltage and current get disrupted. Voltage

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variation is the result of significantly varying loads connected to the system. Some of the electrical and electronic devices are sensitive to gradual variations in the voltage rather than sudden changes in the voltage.

2. VOLTAGE SAG CHARACTERIZATION

2.1 NEED OF CHARACTERIZATION

The complete study of voltage sag characterization is very important in order to properly analyze the power quality disturbances due to voltage sag. Location of fault is one of the main points on which characteristics of sag depend. Basically voltage sag is characterized by magnitude and duration but besides this, there is also one more term associated with this that is phase angle shift. One more term which affects the characterization is unbalanced voltage sag.(6) So, voltage sag characterization is done on the basis of magnitude, duration, phase angle jump and unbalance of sag. Further duration is also subdivided into three categories- instantaneous, momentary and temporary.

2.2 MAGNITUDE

Magnitude of voltage sag can be defined as the value of the remaining voltage during the event. To obtain magnitude of voltage sag, we use RMS voltage alternatively, by fundamental RMS voltage and by peak voltage. In case of three phase system, if the sag is symmetrical, the lowest remaining voltage in any one of the three phases is used to characterize while if it unsymmetrical, the voltage sag is characterized by the use of the phase having lowest remaining voltage.(1)

Magnitude of voltage sag depends upon fault location, fault clearing devices and also on configuration of system.

To calculate magnitude of voltage sag, use the following equation.

$$V_{sag}= \{Z^F/ (Z^S+Z^F)\}E$$

Whereas,

V_{sag} = Magnitude of voltage sag

Z^F = Impedence between the fault and the pcc (point of common coupling)

Z^S = Source Impedence

Assume the pre-fault voltage as 1 pu. Therefore E=1

So,

$$V_{sag} = Z^F/(Z^S+Z^F)$$

fault closer to the pcc sag becomes deeper that is small Z^F. Z^S is larger, for weaker supplies sag becomes deeper.

2.3 DURATION

Duration of voltage sag is the time period for which the RMS value of voltage is below the threshold value of voltage. Duration of voltage sag depends on the fault clearing time required by the protective devices installed in the system. Faults occurred in distribution systems are cleared slowly as compared to that of transmission system. So in distribution system, duration of voltage sag is more depending on the location of fault in the system. To determine the duration of sag in three phase system, all three

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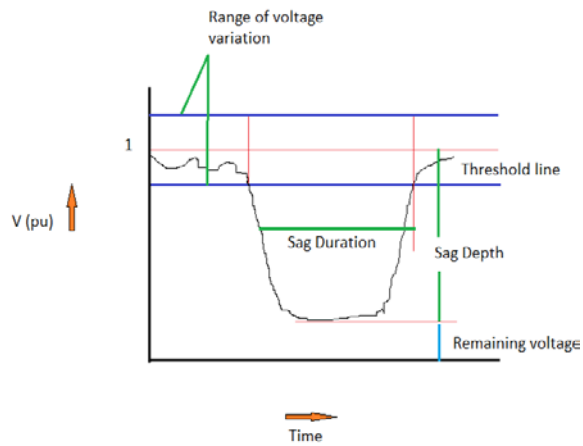
RMS values of voltage have to be taken. The voltage sag starts when at least one of the three phase RMS voltages goes down to the threshold value and sag ends with all the three phase voltages recovered or say regained.



2.4 UNBALANCE OF SAG

Depending on the type of fault, sag is of two types that is symmetrical and unsymmetrical. When three phase fault occurs, the sag will be symmetrical but when single phase, double phase or double phase to ground fault occurs the sag in the three phase is not symmetrical, it is called as unbalanced sag. Sag due to symmetrical fault propagates through transformers without any change while that in case of unsymmetrical, strongly affects the transformer connection.

2.5 PHASE ANGLE JUMP

In order to get the phase angle jump of a sag, the phase angle of voltage before the sag event and the phase angle of voltage during the sag event are taken as main concern. Phase angle jump is located at the time domain plot of sag as a shift in voltage zero- crossing. Generally when source and feeder impedance have equal X/R ratio no phase angle jump takes place in case of faults occurred in transmission systems but this does not happen in case of distribution systems. For unsymmetrical faults, phase angle analysis becomes much more complex as in such faults, single phase load experiences significant amount of phase angle jump even for equal X/R ratio.

For phase angle jump

$$\bar{V}_{sag} = \bar{Z}^F/(\bar{Z}^S+\bar{Z}^F)$$

$$\bar{Z}^S = R^S + jX^S$$

$$\bar{Z}^F = R^F + jX^F$$

If $\frac{X^S}{R^S} = \frac{X^S}{R^F}$

There is no phase angle jump. (1)

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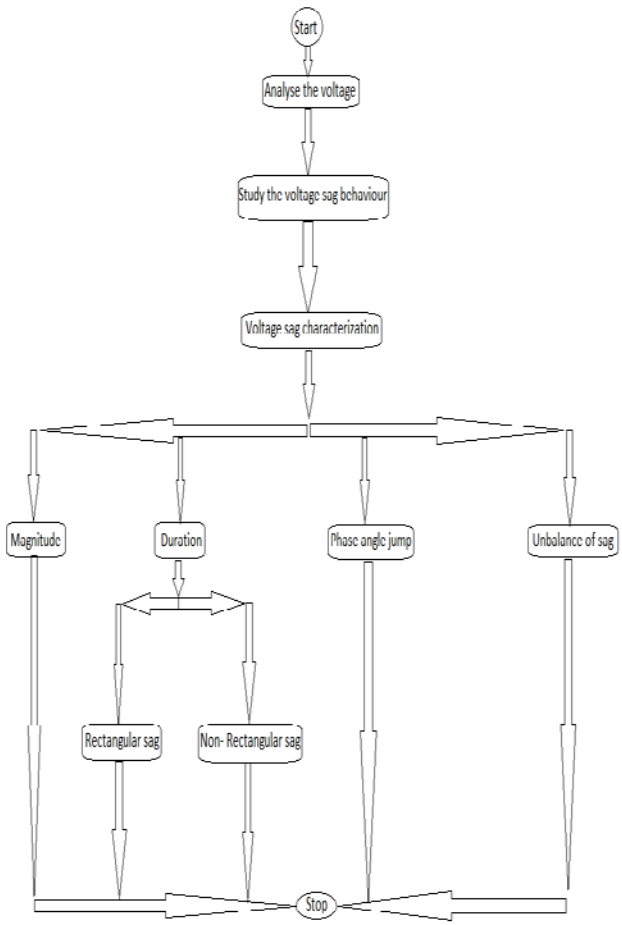

3. FAULTS

Fault which causes voltage sag are as follows.

1. Single line to ground fault.

2. Line to line fault.

3. Two line to ground fault.

All the above mentioned faults seriously effect the phase angle, duration, magnitude.

3.1 SINGLE LINE TO GROUND FAULT

This fault arises due to short circuit between any one of the phase conductors and earth that is may be due to breaking of line conductor and falling to the earth or due to insulation failure between two conductors.

Voltage sag due to this fault causes suppressed voltage with a large phase angle jump in the faulty line during the sag while the phase angle of the other two remains the same as it was before the sag event. In short it is abbreviated as SLG. To simulate this all the three sequence networks are needed and current in all the sequences are same in magnitude and phase angle.

3.2 LINE TO LINE FAULT

Line to line fault arises due to short circuit of any two lines. Voltage sag due to this fault changes the characteristics for phase angle as well as the magnitude. To simulate this, zero sequence network not required and the positive sequence and the negative sequence are connected in opposition.

3.3 TWO LINE TO GROUND FAULT

Two line to ground fault arises due to short circuit between any two lines and the earth. To simulate this all the three sequence network are required and the negative and zero sequence are connected in parallel.

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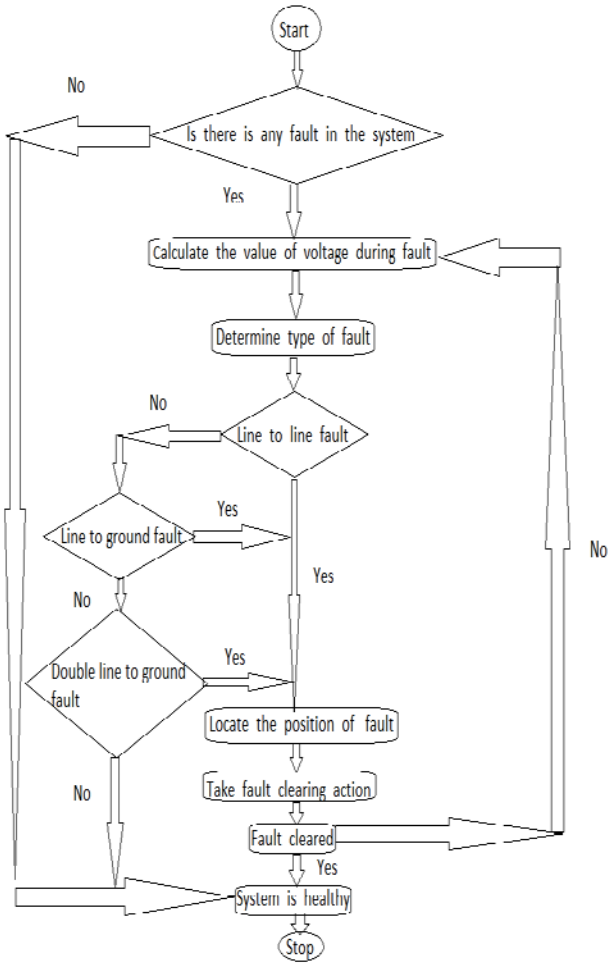

4. RMS METHOD

RMS method is use for signals which are periodic in nature. Here, in this calculation it is used as to fetch information regarding distortion of periodic signal to non-periodic due to power system disturbance. There is two RMS voltage that is continuous RMS voltage and discrete RMS voltage.

Continuous RMS voltage is sudden change in the voltage amplitude which take one cycle to achieve new RMS value exactly. Whereas, discrete RMS voltage contain two samples one before the event sample and the other is after the event sample which results in RMS value between the two that is previous and new RMS value of voltage.

4.1 RMS CALCULATION

The straight way to calculate out the voltage dip or sag is by calculating the lowest remaining RMS voltage.

N= Number of samples per period

then the RMS voltage at any point say q is

$$V_{RMS}(p)=\sqrt{\left[\frac{1}{N}\sum_{i=q-N+1}^{i=q}(v_i)^2\right]}$$

Voltage sag can be written as function form as

$V_p \sin(wt)$ $\quad t < t_1$

$V(t)= V_p \sin(wt)$ $\quad t > t_2$

$V_{p\,sag} \sin(wt + \Phi)$ $\quad t_1 < t < t_2$

w = Angular frequency

V_p= Peak before fault voltage

$V_{p\,sag}$= Peak voltage at the time of sag

Φ = Phase angle shift

t_1= Time of initiation of sag

t_2 = Time of recovering of sag

$\Delta t = t_2 - t_1$ = Duration of sag

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5. Simulation

Simulation study is done on MATLAB. Graph shown below when transformer is star - star connected.

FOR SINGLE LINE TO GROUND FAULT -

(a)

(b)

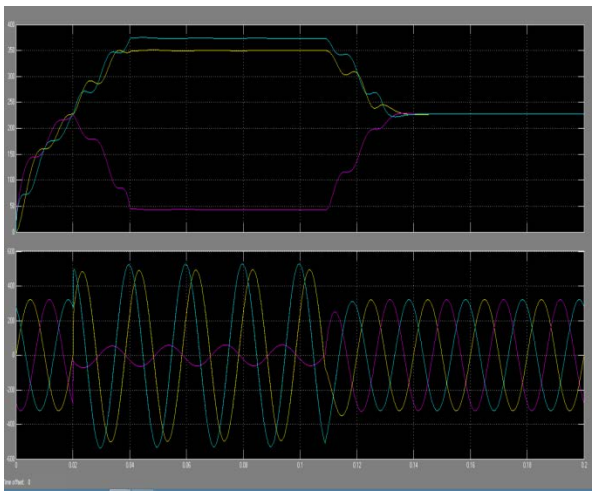

Fig 1 :(a) RMS voltage waveform (b) Instantaneous voltage waveform

FOR LINE TO LINE FAULT -

(a)

(b)

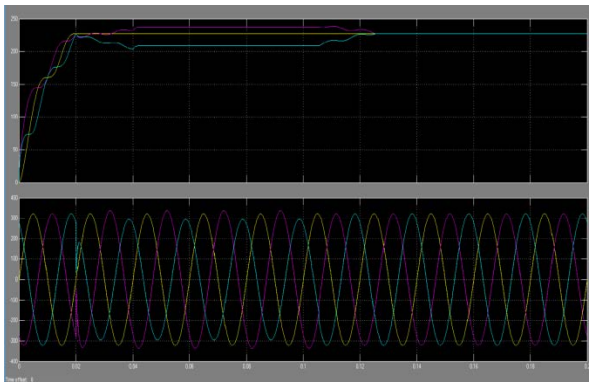

Fig 2 : (a) RMS voltage waveform (b) Instantaneous voltage waveform

FOR DOUBLE LINE TO GROUND FAULT -

(a)

(b)

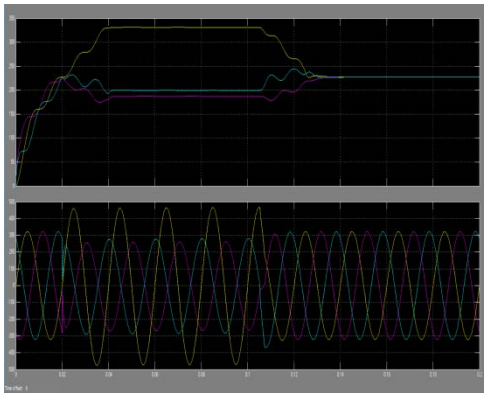

Fig 3 : (a) RMS voltage waveform (b) Instantaneous voltage waveform

Table 1 - Simulation Parameter

COMPONENT	PARAMETER
Source	100MVA, 11Kv, X/R= 19
Frequency	50 Hz
Transformer	8MVA, 11/0.4 Kv
Load	150 KW, 10 KVAR

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6.CONCLUSION

Voltage sag analysis can be done on computer simulation such as MATLAB/SIMULINK, MiPower etc. Day by day advancements made in software will give more accurate result for sag in voltage.

In this paper analysis of voltage sag is done on MATLAB/ SIMULINK by using sim power system tool when the transformer is star-star connected. Further research work should be done on advance computer simulation software in order to achieve high accuracy.

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Article

A Environment and some concerns

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Introduction:

Environmental Economics is an emerging area in the real of economic science. Arun Balasubramanian stated that "No longer is economics merely a science of production and distribution, it has to take into account the ecological repercussions of economic activities that could affect both production and distribution." It means that economics as subject cannot exist in isolation, it cannot even be a mere study of how goods and services are produced, but at the same time it has to take into consideration the impacts of the use of resources on the environment.

Environment can be defined as the total planetary inheritance & the totality of all resources. It is the sum of all external conditions & influences that affect the development and survival of an organism or group of organisms. As an economy develops it's activities put pressure on its finite natural resources and create an impact on human health & well-being. Air pollution, water contamination, soil erosion deforestation & wild life extinction are some of the most pressing environment concerns of India.

We have on one hand threat of poverty induced environmental degradation & at the same time, threat of pollution from affluence and a rapidly growing industrial sector.

Causes of environment degeneration:

Various factors are responsible for environmental degradation some of them are:

- Increasing population density leads to soil & water pollution.
- Urbanization puts pressure on existing infrastructural facilities and causes environmental degradation.
- Use of high yielding variety of seeds,insecticides, pesticides, fertilizers lead to environmental degradation.
- Rise in economic activities and industrialization raises pollution of air water & noise.

Some Global Issues:-

- Global warming is a gradual increase in the average temperature of the earth's lower atmosphere caused by increase in greenhouse gases. Man-made activities cause global warming which vary across regions & within countries. Examples can be melting of polar ice caps, Disruption of drinking water supplies, Extinction of species etc.

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- Ozone depletion refers to phenomenon of reduction in the amount of ozone in the stratosphere. Depletion of ozone can cause skin cancer. It can lower the production of phytoplankton & other aquatic organism.

- Environment crisis**,** Rising population, affluent consumption & production of rich puts a great stress on the environment in terms of its functions of supplying resources and assimilating waste. Many resources have become extinct & the waste generated is beyond the absorptive capacity of the environment.

- Rise in opportunity cost of negative environmental impacts. Opportunity cost is the cost of alternative opportunity give up. We have to pay a huge amount for damages done to human health. Due to various economic activities, we have less resource as compared to their demand, this leads to de generation of the environment. We overuse as well as misuse environmental resources.

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

In recent years academics and policy-makers have shown their interest on the issue of sustainable development. The term gained popularity and was used fashionably for global environmental concerns. Sustainable Development will ensure lasting development and non-declining welfare for all.

According to Edward Barbier sustainable development is “one which is directly concerned with increasing the material standards of living of the poor at the grass root level.” Sustainable development implies meeting the basic needs of everyone and extending to all the opportunity to satisfy their aspirations for better life, without compromising on the needs of future.

The Brundtland Commission defined sustainable development as “development which meets the needs of the present without sacrificing the ability of the future to meet its needs.” This definition is treated as the standard definition of sustainable development. This commission emphasized on protecting the future generations as we have a moral obligation to hand over the planet earth in good order to the future generations. The present generation should give better environment to the future generations, no less than what we have inherited.

According to the United Nations Conference on Environmental and Development (UNCED) sustained development is, “Development that meets the needs of the present generation without compromising the ability of the future generation to meet their own needs.”

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Measurement of sustainable development can be quantitative in terms of increased income, real income, educational services, health care, sanitation, water supply, etc. or a fall in absolute poverty, environmental degradation, cultural disruption and social instability.

Hermen Daly, a leading environmental economist, suggested following measures for sustainable development.

- We must limit the human population within the carrying capacity of the environment.
- Technological progress should be input efficient.
- Extraction of renewable resources should be on sustainable basis.
- For non-renewable resources, the rate of depletion should not exceed the rate of creation of renewable resources.
- Inefficiencies caused by the pollution should be checked.

We can achieve sustainable development by using non-conventional sources of energy. In India we use thermal and hydro power to meet our power needs which cause adverse environmental impacts like emission of large quantities of carbon dioxide gas, fly ash, which can cause pollution of water, land and environment, damage forests and disrupt the natural flow of water. To avoid this we can use Wind power and Solar rays as they are cleaner and greener. Use of wood, dung cake or other biomass as fuel should be discouraged as they cause deforestation, reduction in green cover, wastage of cattle dung and air pollution. On the other hand, use of Gobar Gas Plants, Liquefied Petroleum Gas, Compressed Natural Gas, Wind Power, and Solar Energy should be encouraged. We must use non-conventional sources of energy to minimize the adverse environmental impacts.

Environmental Impact Assessment:

Concern for environmental quality is a recent phenomenon. As we all know that during development process, economics activities affect the environment positively as well as negatively. The negative effects are unexpectant/unanticipated and sometimes everlasting. Environment damage of today can be due to our action of previous years. We go on producing goods by exploiting natural resources without estimating the damages caused by our action. This worried environmentalists all over the world. They suggested that there should be Environment Impact Assessment of any development project.

The objective of EIA is to achieve sustained development with:

1. A minimal environmental degradation and,
2. Prevention of long run environmental adverse effects.

EIA involves evolution of environmental implications and incorporation of necessary safeguards for those activities having a bearing on environmental quality.

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Evaluation of positive (beneficial) and negative (adverse) effects can be studied both quantitatively and qualitatively.

According to the UN Economic Commission for Europe "the purpose of environmental impact assessment is to give environment its due place in the decision making process, by clearly evaluating the environmental consequences of a proposed activity before any action is taken."

EIA is mandatory in almost all the countries of the world & it represents a summary of the environmental inventory & the findings of environmental assessment. It includes socio-economic factors like cultural impacts, employment, rehabilitation of the marginalized group etc. It also includes biophysical, ecological impacts of development activities. Before execution of any project it is sent to The Ministry of Environment, Govt. of India where documents about EIA report & techno-eco study are submitted. EIA report is about consequent environmental damages, while techno-eco study is about technological & economic viability & feasibility of commissioning such projects. EIA study, studies about economics economic advantages & disadvantages, adverse effects on air, water, environmental, flora-fauna & natural habitats by a proposed project. It requires purpose & scope of the study, specific general & technological requirements,

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GROUND WATER PROSPECTS ZONATION USING REMOTE SENSING AND GIS - A CASE STUDY OF NANI RIVER SUBBASIN , KHARGONE DISTRICT, M.P., INDIA

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ABSTRACT
Water is an important natural resource, which is available both on surface as well as in recharge zone of weathered layer and in various other suitable water reservoir formations/structures below the surface. As the availability of surface water is erratic and irregular one needs to study and map the underground water reservoirs. In the present study an attempt has been made to explore the ground water potential zones of Nani River subbasin, Khargone District, Madhya Pradesh using RS and GIS Techniques, despite of sufficient rainfall, the terrain and soil condition allows little storage of water. Hence, the region faces shortage of water in dry seasons. Therefore, it is necessary to explore and study the ground water resources effectively using suitable techniques. In the present study, thematic maps are used to perform weightage analysis in Arc GIS thus producing ground water resource prospect map of the area.
The study has brought out that the high groundwater potential zones are confined along lineaments and in pediplain areas especially in the hard rock terrain valley fills form potential zones. The other geomorphic units like pediment and denudational hills form zones of moderate groundwater prospects.

INTRODUCTION

In hard rock terrains, availability of groundwater is of limited extent which is confined to fractured and weathered zones which are expressed as lineaments. The concept of integrated remote sensing and GIS has proved to be an efficient tool in integrating urban planning and ground water studies (Krishnamurthy et al., 2000; Khan et al., 2006).
Weightage analysis in GIS environment has worked out as an efficient tool to recognize ground water potential zones in the watershed. In the present study, an attempt has been made to identify the Ground Water Prospect zones of Nani River subbasin Khargoan District Madhya Pradesh. The groundwater prospect map is a systematic effort and has been prepared considering the major controlling factors, which influence the water yield.

STUDY AREA:

The study area fall under Maheshwar block of Khargone district lying in the state of Madhya Pradesh with geographical extends from 75o 39’ 12.312” N, 22o 22’ 3.696”E to 75o 39’ 5.532” N, 22o 22’ 3.804”E covering an area of 124.12 sq. km. and is geologically located on the south west boundary of Madhya Pradesh. It is bonded on east by Khandwa, on north by Dhar and Indore districts, on west by Jhabua district and on south by Maharashtra. Narmada is the river which flows in the district from east to west in which Nani river drains. The study area is well connected with state highway 38 (connecting Bandheri (NH-59)-Manawar-Khalghat-Maheshwar-Badwaha Road) and state highway 1 (connecting Mau – Mandleshwar – Kasrawad – Khargone – Bistan - Bhusawal Road) and nearest town being Mandleshwar and Maheshwar on state highway 38 besides the area is well connected with rail network also.

MATERIAL AND METHODOLOGY:

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The main objective of our study is to gather sufficient information about the study area in order to better understand the problems associated with in reference to water and present a highly effective plan in order to overcome the problems. Watershed and associated problems being highly complex requires a greater attention to minutely study each and every element affecting its existence. The present investigation requires all those data that has been collected, generated, updated and verified from a verity of sources.

Survey of India toposheet of scale 1:50,000 have been used as a source for base map generation. The toposheet is registered in Arc GIS to produce a base map. This reference has been used to georeference the satellite data. Government agencies have been approached for the complementary data collection.

The details of the basic and ancillary data are as below:

- Survey of India topographical sheet No. 46N/11, 46N/12, 46N/15 & 46N/16 on 1:50,000 scale.
- GeoEye-1 satellite data for year 2011 with a resolution of 0.5m has been used to generate various thematic incorporated in the study.
- Published reports, geological map and concerning literature of the area were collected from Geological survey of India and other institutions and agencies.
- STRM data has been used to generate the slope map.

Satellite data is rectified geometrically and registered with SOI topographical maps on 1:50000 scale using ArcGIS software through map to image registration technique. The satellite data is processed through digital image processing technique for better interpretation of the geological, geomorphological (The data was supported by STRM DEM for landform mapping) and structural information, which has been digitized, edited for topology creation GIS environment. Thereafter the process of overlay assessment is performed by the integration of multi-thematic information and delineation of groundwater prospect map. The generated groundwater prospect map has been verified for the authenticity.

INTEGRATION IN GIS ENVIRONMENT:

1. Geology:

Whole study area is occupied by the Deccan trap formation represented by horizontal lava flows of basaltic composition, thought to have been emplaced from fissures towards the close of the Mesozoic era, on to the lower tertiary era. These are referred to a Deccan traps owing to their prevalent occurrence in the Deccan, and the step like appearance of their exposures. They have a general tendency to form flat topped hills giving rise to plateaus, comprising several lava flows, each ranging from a few meters 10 to 50 meters in thickness. The lithological units forming a flow may be differentiated from one another from their physical characteristics, such as their texture, jointing development, and mineralogical peculiarities. The traps in the study area bear deep brown to black cotton soil.

2. Geomorphology:

An integrated study of the geology and evolution of landforms is useful to understand the occurrence of porous and permeable zones (Karanth, 1987). Geomorphology of an area depends upon the structural evolution of geological formation. Geomorphology reflects various land form and structural features. Many of the features are favourable for the occurrence of groundwater and classified in terms of groundwater potentiality. In the study area five distinct geomorphic units have been observed viz., pediment, pediplain, valley, structural hill and residual hill.

3. Slope:

Slope of an area is the major controlling factors of groundwater recharge as it influences surface and subsurface flow of rain water and its recharge to the groundwater reservoir. The slope is defined in terms of the maximum rate of change in height across a region of the surface. The slope map has been prepared from SRTM DEM. The slopes in the study area have been categorized into three classes as gently slope, moderately slope and steep slope. The elevation of the study area ranges from 823.192 to 150.226mts above MSL. Slope trends from north to south along the basin.

4. Lineament:

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" Lineament are linear to curvilinear lines on the satellite imagery and are often marked by the presence of moisture, alignment of vegetation, straight streams/ river courses, alignment of ponds/tanks, etc. These lineaments can be further subdivided into faults, fractures and shears based on image characteristics and geological evidences."

In technical terms lineament is employed to different geological features viz. shear zones, faults, rift valleys, truncation of outcrops, joints, fractures, litho-contacts, lines of significant sedimentary changes topographic alignment like ridges or subsidiaries and vegetation alignment etc.

In the present study lineament are the major factor that offer the ground water recharge and the map has been prepared by manual interpretation followed by ground verification.

5. Drainage Density:

Drainage map has been digitized from geoeye-1 multispectral satellite image with 0.5m resolution. In the study area denderitic to sub denderitic drainage pattern has been observed with 7 as the highest order of drainage. The drainage density is act as an inverse function of permeability. Drainage density is defined as total stream length per area. The suitability of groundwater potential zones is indirectly related to drainage density because of its relation with surface runoff and permeability.

6. Soil:

Soil is also an essential aspect for recognition the groundwater potential zones. The analysis of the soil type reveals that the study area is mostly covered by extremely shallow, somewhat excessively drained, loamy-skeletal soils on moderately steep sloping hilly terrain with very rigorous erosion and moderately rocky.

WEIGHTAGE ASSISSMENT:

The groundwater potential zones map is obtained by overlaying all the thematic maps followed by weight overlay analysis in GIS environment. In the process each thematic unit is rated individually. Thereafter all the thematic vector maps are converted into raster maps and superimposed by weighted overlay method. In the process of weight assignment maximum value is given to the feature with highest groundwater potentiality and the minimum given to the lowest potential feature. These values are summarized in the Table 1 below:

The groundwater prospects map has been prepared by integrating the geology, geomorphology, soil, slope, drainage and lineament through the process of weightage assessment technique in the GIS environment.

CONCLUSION:

The study indicate that both high, moderate and low potential zones of ground water prospect are noticed in the study area, Rainwater harvesting or any other artificial recharge methods are more suitable to improve the ground water potential in low and moderate potential zones. Recharging process can be made effective and efficient to meet the demands of water for human consumption and irrigation purpose through planning and using appropriate scientific methods and tools.

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Themes	Class	Rank	Groundwater Potential	Weighted
Geology	a. Basalt	1	Good	20
Geomorphology	a. Structural hill	5	Very Poor	25
	b.Decidual/Denudational hill	4	Very poor to Poor	
	c. Pediment	3	poor to Moderate	
	d. Pediplain	2	Moderate to high	
	e. Valley	1	High	
Soil	a. Clayey Soil	2	Moderate	15
	b. Loamy-Skeletal soil	1	Good	
Slop	a. Steep slop	3	Poor to moderate	15
	b. Moderate slop	2	Moderate	
	c. Gentle slop	1	Good	
Drainage Density	a. High	3	Poor	10
	b. Moderate	2	Moderate	
	c. Low	1	Good	
Lineament Density	a. High	3	Good	15
	b. Moderate	2	Moderate	
	c. Low	1	Poor	

Table 1: Rank and weight for different parameter of groundwater potential zones

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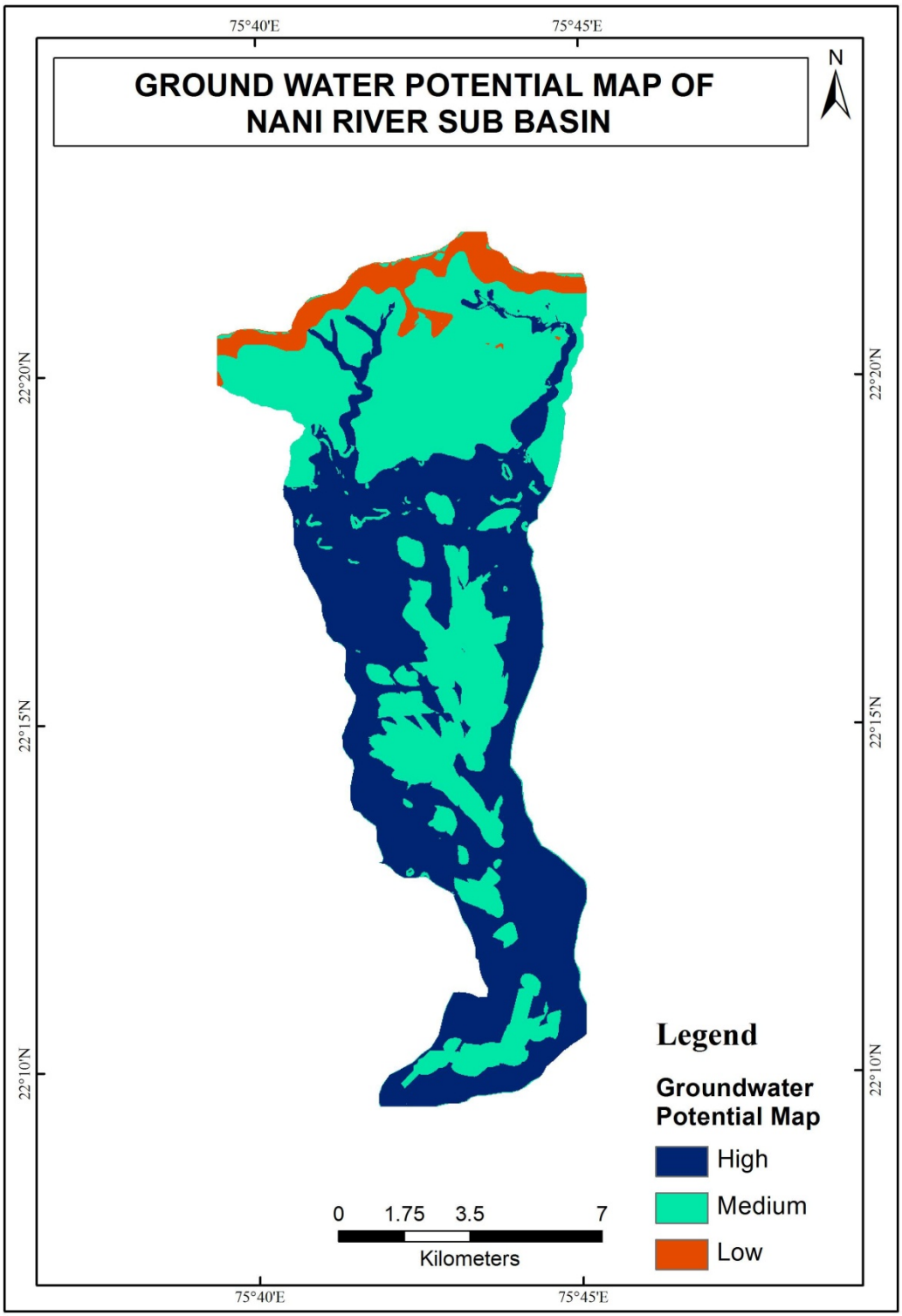

Figure 1: Map representing the groundwater potential zones of Nani River subbasin khargoan district M.P.

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Impact of Winter Fair (Kartik Mela) on Tapti river at Multai, Betul District of M.P.

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ABSTRACT
In this paper effect of anthropogenic activities special reference to Religious activities like Kartik Mela on water quality of Tapti river at Multai district Betul of M.P. has been discussed. In Multai, one month long (November to December) kartik mela (winter fair) is celebrated every year on the origin place of Tapti river. Tapti pond at Multai was selected for study purpose . Water samples were collected during, pre and post seasons of winter fair.

Physicochemical parameters like Temperature, pH, Conductivity, Alkalinity, Total hardness, BOD, COD, DO were analyzed as per standard methods recommended by APHA, WHO. During the fair season major changes were observed in the water quality. The study shows high level of water pollution due to anthropogenic activities like kartik mela.

INTRODUCTION

Tapti also spelled as Tapi is a river in central india, rising in the Gwailgarh hill of the central deccan plateau in south central Madhya Pradesh. Multai city named as it is the origin of river Tapti. Rivers are one of the most important sources of water but there pollution due to anthropogenic activities has created a major global problem. Rivers are life line of civilization. Several activities take place at the banks of river. Water pollution due to sewage and industrial waste discharge into the rivers now become a threat to the ecosystem (Bajpai *et al.,* 2002) as well as religious and pilgrimage activities are also responsible for river pollution. The main objective of the study is to assess the water quality of river Tapti at its origin place at Multai during the festival season.

Rivers are one of the important sources of water but almost all the rivers in India are polluted. It directly or indirectly affect the live process of flora and fauna of the water body, surrounded by chemical toxicants (Krishnan *et al.,* 2007, Variya, 2009 and Varsani, 2009).

Materials and methods –

Water samples were collected from sampling station- Tapti (sarover) pond at Multai during the year 2014. Water samples ware collected from Tapti Sarovar (pond) before fair, during fair and after fair. For analyses of water samples standard methods recommended by APHA , WHO, (1984) and ICMR, (1975) were adopted.

Observation –

S.No.	Parameters	Before Winter Fair	During Winter Fair	After Winter Fair
1.	Temperature ($^{\circ}$C)	27	28	27
2.	pH	7.70	8.00	7.80
3.	Conductivity (µ mhos/cm)	2.10	2.40	2.10
4.	Alkalinity (mg / l)	150	220	138
5.	Total hardness (mg / l)	100	140	105
6.	BOD (mg / l)	4.70	3.20	5.10
7.	COD (mg / l)	7.80	10.20	6.00
8.	DO (mg / l)	5.80	4.20	5.10

RESULT AND DISCISSION–

The results of this work have been depicted in Table No- 1. These data revealed that the water of Tapti pond at Multai was deteriorating due to winter fair. Water temperature of river water was ranged from 27°C to 28°C. Continuous rise in temperature recorded during fair season and lower value of

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temperature recorded during post and pre fair seasons. The temperature rise may be due to various chemicals and their reactions. Similar view was expressed by Murgesan et al. (2004). pH of water indicates water quality of any aquatic ecosystem. The pH of river water ranged from 7.70 to 8.00. The minimum pH value was observed during pre and post fair seasons than fair and festival season. Conductivity of water shows dissolved salts in water. The range of conductivity was observed from 2.10 to 2.40 during the study period. Thousands of people take bath in Tapti sarover during fair season. They use soaps, detergents and wash their clothes. The values of DO, BOD and COD were found to vary from 4.20 mg/l to 5.80 mg/l, 3.20 mg/l to 5.10 mg/l and 6.00mg/l to 10.20mg/l respectively. The DO plays important role in distribution of aquatic organisms. The higher value of water parameters were noted during fair season. The BOD & COD are helpful to know the pollution level of water (Rajkumar et al., 2003).

Hardness of water increases due to polluted water as reported by Goyal et al. (2006). The total hardness of water sample ranged from 100 mg/l to 140mg/l during the study period. Alkalinity of water ranged from 150mg/l to 220mg/l during the before and after the fair season in the year 2014. Higher value of alkalinity was observed during fair seasons.

From the analyses of water quality of Tapti pond at Multai, Betul District of M.P. during fair season , it is clear that the religious activities like kartik mela (winter fair) are also responsible for Tapti pond water pollution at Multai, District- Betul of M.P.

In conclusion, the result of this study reveals that the quality of river water is not fit for drinking and domestic purposes during fair season. There is an urgent need to control the water pollution to restore the quality of water body of Tapti pond.

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GROUNDWATER PORTABILITY OF NANI RIVER SUBBASIN KHARGOAN DISTRICT M.P. INDIA

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ABSTRACT
Population growth has abruptly pressurized the groundwater resources but in such explorations and consumptions the chemical parameters goes unnoticed that need to be attended for safeguarding the adverse effects of contagious and unbalanced water chemistry. Keeping this prespective in mind the groundwater chemistry and its past history has been analyzed. To attain this objective 25 villages sample point stations has been has been explored and analyzed for the The result of chemical analysis of water shows that certain samples have crossed the threshold limits that need to be attended in order to cope up with the adverse effects due to such disturbances.

INTRODUCTION

The growing population has led to the pressure on the surface water bodies and dragged the focus on the groundwater to satisfy the growing demands. Groundwater is an important water resource in both the urban and rural areas because of the expanding population. Ground water, surface water (rivers, streams and ponds), atmospheric water (rain-water, snow and hail) and springs are the main source of water available to the people in general. The qualities of these water bodies vary widely depending on the location and environmental factors. (Tay, 2007). The major source of ground water is precipitation that infiltrates the ground and moves through the soil and pore spaces of rocks. Other sources include water infiltrating from lakes and streams, recharge ponds and waste-water treatment system. As ground water moves through soil, sediment and rocks, many impurities such as disease-causing micro-organisms are filtered out.(Freeze and Cherry,1979). Keeping the fact in mind naturally surface water bodies are highly subject to contamination and pollution whereas groundwater is less susceptible groundwater exploration has gained greater importance devoid of the fact that groundwater also poses health risk if the groundwater is not analyzed for its chemical composition especially in the soil rich in minerals as in the case of the study area. The study area is engulfed by the deccan basalt and is situated in the state of Madhya Pradesh where fluorine contamination is the greatest issue in respect to the groundwater parameters.

STUDY AREA:

The study area fall under Maheshwar block of Khargone district lying in the state of Madhya Pradesh with geographical extends from 75o 39’ 12.312” N, 22o 22’ 3.696”E to 75o 39’ 5.532” N, 22o 22’ 3.804”E covering an area of 124.12 sq. km. and is geologically located on the south west boundary of Madhya Pradesh. It is bonded on east by Khandwa, on north by Dhar and Indore districts, on west by Jhabua district and on south by Maharashtra. Narmada is the river which flows in the district from east to west in which Nani river drains. The study area is well connected with state highway 38 (connecting Bandheri (NH-59)-Manawar-Khalghat-Maheshwar-Badwaha Road) and state highway 1 (connecting Mau – Mandleshwar – Kasrawad – Khargone – Bistan - Bhusawal Road) and nearest town being Mandleshwar and Maheshwar on state highway 38 besides the area is well connected with rail network also.

GEOMORPHOLOGY:

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Physiographically the area shows variant topography. The northern part of the area is a hilly terrain followed by plains towards the south with a few remnants of residual hill and undulating plain with mesas and buttes. The area bears the maximum elevation of 823.19m above msl about 2 km of Jam Khurd village covered by forest and lowest point being 150.23m above .MSL. lying southwest of Kunda Village.

HYDROGEOLOGY:

Geologically the study area belongs to the basalt lava flow of Malwa group and being the rock or ingenious origin it rarely bears major aquifers in the form of primary porosity and in such areas the groundwater hydraulic activity is ruled by secondary permeability that is in the form of structures and lineaments. Nani River is the major river in the area which remains dry in the months of summers and thus groundwater forms the only source of water in the area. As per the ground water table records of the study area it is quite significant to conclude that the groundwater is exploited to satisfy the growing demands.

CLIMATE:

The study area lies within the limits of the tropics thus; the climate of the basin is humid and tropical, although at places extremes of heat and cold are often encountered. The area experiences winter which commences in November and continues till the end of February, is characterized by bright cloudless days and clean nights and piercing winds with a hint of precipitation in the basin during this season. The hot weather starts in March and continues up to the middle of June. May is usually the hottest month. This season is generally dry. The south-west monsoon sets in by the middle of June and withdraws by the first week of October. Rainfall last from June to September during this season, the weather is somewhat sultry and oppressive, especially in areas adjoining the Narmada River. Besides, a few thunder-storms occur, especially in October. Thereafter, the weather clears up and dry pleasant weather prevails throughout the valley. (Source: Report of Irrigation Commission, 1972).

MATERIALS AND METHODS:

Water samples for 25 villages were analyzed to assess the groundwater quality of the Nani River subbasin. The analysis includes the physico-chemical examination which is field based as well as laboratory based. The parameters includes examination of the water quality attributes such as: pH, hardness, total dissolved solids, nitrates, sulphate, fluoride, bicarbonates, carbonates, iron, alkalinity and chlorides.

RESULT AND DISCUSSION:

Physico-chemical parameters of Nani River sub-basin has been summarized in Table no.1.

Groundwater Quality Assessment:

Evaluating and understanding the chemical parameters associated with the groundwater prior to the utility determination is extensively important thus, the data obtained for 25 villages of Nani River subbasin have been evaluated for suitability in terms of drinking.

Portability of groundwater for drinking and domestic use:

The analysis for the water samples has been compared with the standard guideline values recommended by World Health Organization, WHO (2006) and Bureau of Indian Standards, BIS (2003)

Ideally, pH should range from 6.5 to 8.5 but in the study area the pH ranges from 6.3-12.2 for year 2013 and from 6.2-12 for year 2010. That samples that do not fall under the safe limit has been highlighted in the table 1.1.

Total Dissolved Solvents should be within the range of 500. Detailed examination of the TDS for the study area reveals that the value do not exceeds beyond 375 NTU for year 2013 and 360 for year 2010 suggesting that the parameter is under controlled situation.

Hardness is one of the important chemical parameters that need to be determined when studying the water quality. In the present study area the maximum value observed for hardness is 1000mg/l and the minimum value found is 2 mg/l for year 2013 and 960 is the maximum hardness and minimum being 140 for year 2010. As per the specification of BIS the maximum permissible limit ranges from 300-600 ppm. Considering the specifications set by BIS for year 2013 six sample stations are found to suffer from hardness defect but in year 2010 five station suffered hardness defect. Hardness induces the precipitation of calcium

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carbonate thus encrustation of the water supply system.

Carbonate in groundwater should be beyond 200 and so is bicarbonate. All the sample station revives the safer limit of carbonates but the bicarbonate concentration ranges upto 491.99 for year 2013 and 459.68 for year 2010. Detailed value for the 25 sample stations suggests that 24 out of 25 stations violated the value as per WHO but in accordance with Indian standards the value illustrates the controlled conditions.

The study area has chloride concentration range 60-190 mg/l for year 2013 and 50-160 mg/l for year 2010. The value suggested by BIS states concentration below 250 is considered safe. So, as per the survey and analysis the area hardly bears chloride concentration beyond the permissible limit and thus it is under controlled conditions.

Fluorine concentration is the most commendable distortion in the ground water quality of the study area and the entire region posing tremendous health issues on the population. In the study area fluorine concentration ranges from 0.08-6.07 mg/l for year 2013 and 0.01-4.2 mg/l for year 2010 and the permissible limit set by BIS is 1-1.5 ppm. Studying the fluorine concentration of the study area for 2013 and 2010 reviles 3 out of 25 sample point stations reported the major defect of fluorine in ground water. These 3 sample point stations are dental and skeletal fluorosis such as mottling of teeths, deformation of ligaments and bending of spinal chord.

Nitrate concentration in groundwater ranges from 0.6-10.88 mg/l for year 2013 and 0.09-6.5 mg/l for year 2010 and the permissible limit setup by BIS ranges from 45-100ppm and as per Indian standards100 ppm. Considering the guidelines set by BIS and IS the nitrate concentration is within control.

The concentration of sulphate ranges from 6.43-229.74 mg/l for year 2013 and and 63.56-223.16 mg/l for year 2010. The permissible limit ranges from 200-400 ppm. Stating that all the sample stations illustrated the safe sulphate concentration.

The study area demonstrates iron concentration ranges from 0.01-0.38 mg/l for year 2013 and 0.01-0.36mg/l for year 2010.

Alkalinity, the buffer for pH in the study area ranges from 210-475mg/l for year 2013 200-460 mg/l for year 2010. This factor is considered important only for acidity and basicity regulation and does not hold major health significance but it only determines the level to which pH can be regulated.

S.N.	VILLAGE/TOWN	PH_13	PH_10	TDS_13	TDS_10	Alkalinity_13	Alkalinity_10	CO3_13	CO3_10	HCO3_13	HCO3_10	Cl_13	Cl_10	F_13	F_10	NO3_13	NO3_10	SO4_13	SO4_10	Fe_13	Fe_10	TH_13	TH_10
1	DHARGAON	7.5	7.2	100	95	250	240	9.61	8.98	279.2	268.2	120	110	1	0	0.6	0.09	65.4	63.6	0	0.1	150	140
2	SULTANPURA	7.4	7.3	50	45	340	335	4.64	4.55	272.2	264.3	110	100	1	1	1.92	0.5	90.7	88.1	0	0.2	250	240
3	KARONDIYA	7.5	7.5	0	0	320	315	6.42	6.23	278.2	264.4	120	115	1	1	1.74	0.8	86	83.5	0	0.2	225	210
4	HARASGAON	7.7	7.6	25	20	290	280	8.39	8.27	288.7	269.8	135	120	1	1	1.61	0.95	78.5	76.3	0	0.2	225	220
5	CHUNDRIYA	7.8	7.7	25	20	350	340	12.7	12.4	286.7	268.5	100	95	1	1	2.97	0.98	109	106	0	0.2	225	220
6	JHAPARI	7.9	7.7	25	22	330	325	11.2	11.1	297.2	290.2	125	105	1	1	2.51	1.03	93.7	91	0	0.2	225	210
7	MOGAWA	8.2	8.1	0	0	380	360	4.14	4.09	305.2	300.3	80	65	1	1	4.41	1.2	125	121	0	0.3	175	160
8	KAVARAYA	7.9	7.8	25	24	330	325	12.9	12.7	319.4	310.7	95	80	1	1	5.03	1.9	109	106	0	0.3	200	180
9	KUNDYA	8.1	8	25	20	360	350	11.3	11.2	110	101.9	80	65	1	1	5.48	2.03	120	117	0	0.3	200	185
10	MOHAD	8.3	8.2	0	0	385	380	9.84	9.68	325.1	318.7	65	50	1	1	6.41	2.09	135	131	0	0.3	200	180
11	BARDIYA	7.8	7.6	100	90	430	420	12.6	12.3	326.5	316.9	85	75	1	1	7.79	4.8	150	146	0	0.4	610	385
12	JHIRANYA	7.1	7	25	24	295	290	7.44	7.26	343.5	326.7	80	70	0	0	7.26	4.8	127	123	0	0.3	250	245
13	SOMAKHERI	8.5	8.3	50	44	370	360	7.89	7.32	364.7	355.6	60	55	0	0	9.1	6.5	157	153	0	0.1	400	385
14	GULAWAD	7.4	7.2	25	23	310	310	6.76	5.98	361.5	348.9	70	60	0	0	8.42	3.48	146	141	0	0.2	325	300
15	CHIKLI	8.9	8.8	50	48	375	370	6.36	6.16	376.7	354.9	65	55	0	0	9.61	3.54	164	159	0	0.1	475	465
16	BHAKLAY	11	10	50	46	475	460	10.8	10.3	390.7	360.6	90	85	0	0	10.9	4.56	161	156	0	0.1	600	585
17	BAGDARA	7.9	7.6	75	72	300	290	11.4	11.1	396.3	368.2	90	80	1	1	8.85	4.28	167	162	0	0	260	250
18	NAVARANGPURA	11	11	125	110	410	400	11	10.1	405.2	386.4	95	90	1	1	10.2	3.78	169	164	0	0.2	850	820
19	BRAHMANGHATI	12	12	150	142	430	420	9.64	9.31	400.1	388.3	100	80	1	1	9.96	3.62	145	141	0	0.3	975	960
20	SIRALYAMAL	12	12	175	170	440	430	7.89	7.25	404.1	376.7	100	85	1	1	10.1	3.54	153	148	0	0.3	1000	850
21	BEKALYA	12	12	175	168	430	425	8.84	8.54	408.7	378.6	105	90	1	1	10	3.69	161	157	0	0.3	1000	890
22	AHLIYAPURA	6.3	6.2	25	20	230	225	12.6	12.2	403.9	374.4	105	90	1	1	7.44	1.65	165	160	0	0	375	350
23	AVALYA	11	11	200	190	400	380	10.5	10.2	413.6	382.6	115	100	2	1	9.6	3.55	169	164	0	0.2	925	900
24	KULALA	6.7	6.5	75	70	210	200	11.9	11.4	480	455.9	140	100	2	1	5.09	1.06	216	210	0	0	275	260
25	JUNAPANI	7.4	7.5	375	360	250	245	5.15	4.96	492	459.7	190	160	6	4	6.57	2.65	230	223	0	0	400	385
	AVERAGE	8.6	8.4	78	72.9	348	339	9.27	8.94	349.2	331.6	101	87	1	1	6.54	2.68	140	136	0	0.2	432	399

Table 1: Groundwater parameters for Nani river subbasin

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Parameters Major ions(mg/L)	Nani river subbasin 2010	Nani river subbasin 2013	WHO (2006)	BIS (2003) Max. Desirable	IS:10500 Highest permissibility
PH	8.44	8.6	7-8.5	6.5-8.5	8.5-9.2
TDS	72.92	78	500	500	2000
T H	399	431.8	500	300	600
CO3	8.94	9.27	200		
HCO3	331.65	349.16	200	200	600
Cl	87.2	100.8	250	250	1000
F	0.85	1.11	0.6-1.5	1	1.5
NO3	2.62	6.54	50	45	100
SO4	135.68	139.68	200	200	400
Fe	0.18	0.2	-	-	-
Alkalinity	339	347.6			

Table 2: Comparative account of groundwater quality of Nani river subbasin with reference to WHO, 2006; BIS, 2003 and IS.

Discussion:

Water quality requires constant monitoring in order to maintain the safer limits. In present study fluorine monitoring requires greater attention as it is most hazardous in comparison to the other parameters. This problem can be overcome by creating people awareness for water quality and continuous monitoring the water quality and taking strict steps to avoid chemically hazardous water consumption**.**

Refereces:

Freeze R A and Cherry J A (1979): Ground water. Eaglewood Cliff N J Prentice-Hale

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A Approach of Groundwater Prospect Study by mean of Geoinformatics Geospatial Technologies

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ABSTRACT
In the present study, an integrated approach has been implemented to delineate possible groundwater potential zones in Karondiya river sub basin located in Maheshwar, Khargone district, Madhya Pradesh using geoinformatics geospatial technology. The availability and distribution of groundwater in hard rock area is in inadequate amount and also not in uniform manner. The delineation of groundwater recharge potential zones is very important to increase groundwater resources and its proper utilization. A variety of thematic maps such as, geology, geomorphology and lineaments, Drainage network map were prepared from geoeye-1, 0.5 meter resolution multispectral satellite image with visual interpretation techniques. These layers integrated into GIS environment to derive suitable ground water potential zones. Each theme and their individual features were assigned weights according to their relative significance in groundwater occurrence. As a result of ground water potential map has been prepared by modeling these parameters. Groundwater potential map results were classified into three classes, these classes are; high, moderate and low.

INTRODUCTION

Material and Method:

Water is an essential natural resource for sustaining life on the earth. Though groundwater contributes only 0.6% of the total water resources on earth, it is the major and one of the most important sources of drinking water in rural as well as urban areas. Groundwater is considered as the major conventional water resource. Maheshwar, Khargone is one of the low rainfall and drought-prone block in the Madhya Pradesh state. Maheshwar is classified among a few block of the Madhya Pradesh state where groundwater is semi-critical, critical and over-exploited (WaterAid India, 2005). Therefore, development and better utilization of water resources is required to satisfy the increasing demand on water. Identification and mapping groundwater potential zones is essential for planning the location of new abstraction wells to meet the growing demand for water.

Remote sensing and GIS technology is the new possibilities for hydrogeological studies (Thomas et al., 1999). High-resolution satellite imageries are widely used in groundwater studies due to their high spectral and spatial resolution. They are used to identify the geology, geomorphology, soil, lineament density, drainage density, rainfall and landuse for maps that indicate the occurrence of groundwater (Preeja et al., 2011) Geoinformatics techniques (GIS and Remote sensing technology) has been used in the several earlier research for the locating of groundwater potential zone (Sener et al., 2005, Ravi Shankar and Mohan, 2006, Solomon and Quiel, 2006, Jha et al., 2007). The overlay analysis by GIS technique was used to delineate the groundwater potential zone studied by (Girish et al., 2008, Nagarajan and Singh, 2009, and Sukumar and Sankar, 2010).

The study area is located in Khargone and Indore districts of Madhya Pradesh and enclosed between latitudes 22°10’0.268" and 22°21’55.019"N and longitudes 75°33’49.108" and 75°39’31.046"E falling in the survey of India toposheet number 46N/11 and 46N/12 on the 1:50000 scale. The total geographical area of the study area is 92.27 Sq Km. The major part

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of the area falling in Maheshwar block, Khargone district, also called West Nimar is located in the south western part of Madhya Pradesh some part of the study area covered by Indore district. The area of study (Maheshwar) located 13 km away from national highway No. 3. And well connected by major roads. The study area is located at a distance of 285.8 Km. from Bhopal, the state capital of Madhya Pradesh (India), 91 km (figure 1).

The thematic maps such as geology, geomorphology, lineament, contour, slope, drainage, etc. are essential for the recognition of suitable groundwater potential zone. These maps were generated using-

1. Survey of India Topographical map 46N/11 and 46N/12 (Scale: 1:50,000)
2. Geoeye-1 satellite imagery (0.5m resolution).
3. Landsat-8 satellite imagery (15m resolution)
4. District resource map
5. ERDAS Imagine 2010
6. ArcMap 10.2

Result and Discussion:

1. **Geology:** Geological structures are very essential for the occurrence of ground water. The total study area covered by basaltic flows of Deccan Traps of Upper Cretaceous to Eocene Period and are composed of black, grayish black, fine to medium grained, moderately porphyritic, hard, compact and massive rock. The present study area comprises the Malwa Group. The study area mainly consists of Deccan basalt lava flow 5, 6, 7 and 11 and aa type Majority of the flows are of Aa type while few are of compound pahoehoe type. These flows are further classified into five formations viz: (1) Indore formation, (2) Kankaria-Pirukheri formation, (3) Mandleshwar formation, (4) Bargonda formation, and (5) Kalisindh formation. On the basis of distinct physical characters of the flows. All the flows are almost horizontally disposed (Figure 2).

2. **Geomorphology:** The identification of geomorphologic features is very important for recognition of groundwater potential zone. The hydro-geomorphological features of the study area were mapped Geoeye-1 satellite image. The major geomorphologic features in the study area are pediment, pediplain, structural hill, valley and denudational hill (Figure 3).

A. Structural hill: The broad structural alignments of these hills are well visible from satellite images and shaded relief derived from DEM. The entire basaltic terrain can be broadly grouped as Deccan Trap Plateau divided in moderate to high dissected basaltic plateau. The landforms of this type occur in the North, Northeast and Northwest part of the study area with average elevation ranging above 600m. This plateau is demarcated by the presence of high hills with severe dissections. Steep outcrops with thin soil cover characterize this landform.

B. Denudational Hills: Denudational hills are the residual of the natural dynamic process of denudation and weathering. The geomorphic forms of denudational hills occur as exfoliation domes, linear ridges, mesas and low mounds with partial debris covered at the foot slopes. The denudational hills in basic intrusive occur as narrow linear ridges within the pediplain. The characteristic of the features is bluish green color and rough texture in the satellite imagery. These hills are covered with medium to big boulders and sparse vegetation. This landform acts as a high runoff zone due to its slope. The groundwater potential possibility of this landform is lo idew to moderate type.

C. 3) **Pediment:** The term pediment is defined, as an eroded rock surface of considerable extent at the foot of a mountain slope or a face formed under arid to semi-arid climate erosion. The pediments have very thin cover of soil, but its thickness may increase away from the pediment junction. The pediment overlies all the lithological units with gentle to moderate slopes and is generally characterized by rugged appearance with number of small outcrops and supports scanty vegetation. Sheet erosion and gullying are very active in the zone of pediment exposing the underlying weathered mantle of bedrock at number of places. The low moisture content of this unit gives a bright signature in the satellite imagery. Pediment follows steep slopes in the study area and is considered as the low to moderate hydrogeomorphic class because it checks the velocity of surface runoff and thus provides chance of water accumulation.

D. Pediplain: Development of a pediplain is a combination of process of stream erosion and weathering. The pediplains are formed as a result of

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weathering under arid and semi-arid conditions, representing the end stage of cyclic erosion. The pediplains are characterized by the presence of relatively thicker weathered material. The extent and thickness of weathering depends on the different factor like slope, resistance of the underlying rock to weathering, joints and fractures and precipitation and climatic conditions of the area. Depending upon the thickness of the weathered zone, the groundwater potential possibility is moderate to high type.

E. Valley: In the study area, the valley are identified between the structural hills on the northern part of the study area. The drainage pattern over the valley fills is parallel to sub-parallel indicating that the drainage is by and large controlled by the lineaments. Valley flats are low linear areas occurring between hills. These units occupy the lowest reaches in topography with nearly level slope. Depending upon the parent rock, the valley fills deposits vary in composition and texture (Agarwal and Garg, 2000). Normally, they are covered with black coarse gravel to sandy and clayey soils.

3. **Lineaments**: The lineaments are linear or curvilinear features identified as long narrow and relatively straight tonal alignments visible in satellite images. Remote sensing data provides useful information to identify structural features and lineaments. The satellite data of Geoeye-1 and Landsat-8 multispectral Imageries have been visually interpreted to identify the lineaments of the basin area. Lineaments play a vital role particularly in geomorphic features and structural lineaments. These are well expressed on Landsat images (Sabins, 1987). A lineament may by a fault, fracture, joint, linear geological formation, the straight course of streams due to these features increased porosity and permeability in hard rock areas and provide an important clue on the surface features which are responsible for infiltration of surface run off into sub-surface movement and it's turned to storage of groundwater. The study area, numerous lineaments have been identified and most of them show NE to SW trending direction (figure 4).

4. **Drainage Density:** The drainage density plays an important role in groundwater potential zone identification. The drainage density is an inverse function of permeability. It is evident; in less permeable rock is having less infiltration of rain fall, which results substantial surface runoff. Hence lesser the drainage density, higher is the probability of recharge or potential groundwater zone. Since the drainage density can indirectly indicate the suitability for groundwater recharge of an area because of its relation with surface runoff and permeability, it was considered as one of the indicators of groundwater potential. The drainage density map explain the flow of water throughout the study area. Drainage density is defined as total stream length per area. . The high drainage density area indicates low-infiltration rate whereas the low-density areas are favorable with high infiltration rate (Figure 5).

5. **Soil:** Soil is also an important factor for detection the groundwater potential zones. The analysis of the soil type reveals that the study area is predominantly covered by extremely shallow, somewhat excessively drained, loamy-skeletal soils on moderately steep sloping hilly terrain (highly dissected) with very severe erosion and moderately stony. Slightly deep, well drained, calcareous, clayey soils on gently sloping undulating plains with mesas and buttes with moderate erosion (Figure 6).

6. **Slope:** Slope map has been generated from digitized contour line in ArcGIS software from SOI toposheet at 20m interval. To prepare a slope map contour values are necessary. After that slope map were reclassified into 5 classes' base on the degree of slope (Figure 7).

Assessment of Groundwater Potential Zone:

The ground water potential zones were obtained by weighted overlay analysis method by the spatial analysis tool in ArcGIS 10.2 GIS software tool ((Figure 8). During the weighted overlay analysis the ranking has been assigned for such individual parameter of each theme and weighted were assigned according of the influence of the different parameters. The weights assigned to different classes of all the thematic layers are given in table 1.

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Themes	Class	Rank	Groundwater Potential	Weighted
Geology	a. Deccan Basalt lavaflow	1	Moderate	20
Geomorphology	a. Stratural hill	5	Very Poor	25
	b. Denudational hill	4	Very poor to Poor	
	c. Pediment	3	poor to Moderate	
	d. Pediplain	2	Moderate to high	
	e. Valley	1	High	
Soil	a. Clayey Soil	2	Moderate	15
	b. Loamy-Skeletal soil	1	Good	
Slop	a. Steep slop	3	Poor to moderate	15
	b. Moderate slop	2	Moderate	
	c. Gentle slop	1	Good	
Drainage Density	a. High	3	Poor	10
	b. Moderate	2	Moderate	
	c. Low	1	Good	
Lineament Density	a. High	3	Good	15
	b. Moderate	2	Moderate	
	c. Low	1	Poor	

Table 1: Groundwater potential for the individual classes in different themes and their ranking.

Conclusion:

The present paper highlights geoinformatics geospatial technologies and presents a state-of-the-art techniques for the groundwater potential zone assessment. The detailed analyses presented in this paper indicated that the current applications of RS and GIS techniques in groundwater hydrology are very advantageous for the delineating of the ground water prospect zone in very effective in term of cost and time with compare to conventional methods.

The groundwater potential zones map has been generated through the weighted overlay analysis method In order to delineate the groundwater potential zones, different thematic layers viz: geomorphology, geology, soil, lineaments, slope and drainage themes has been used for weighted overlay analysis in spatial analyst tool. On the basis of different themes, there are three categories of groundwater potential zones were delineated as (I) poor (9% area) (II) moderate (40% area) and (IV) good (51% area). The analysis showing groundwater potential is the more promising in the pediplaine area comes under good category than moderate belong to denudation hill and structural hills.

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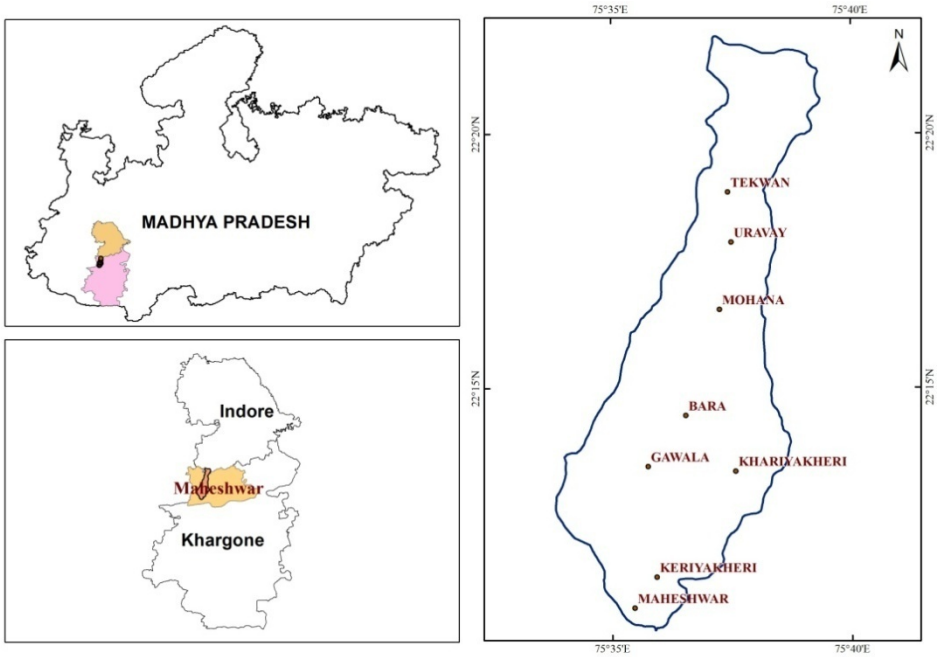

Figure 1: Location Map of the Study Area

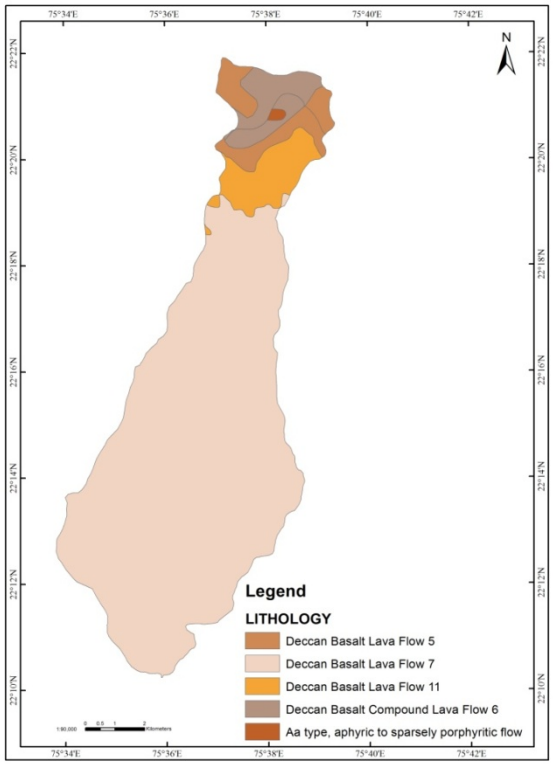

Figure 2: Geological Map

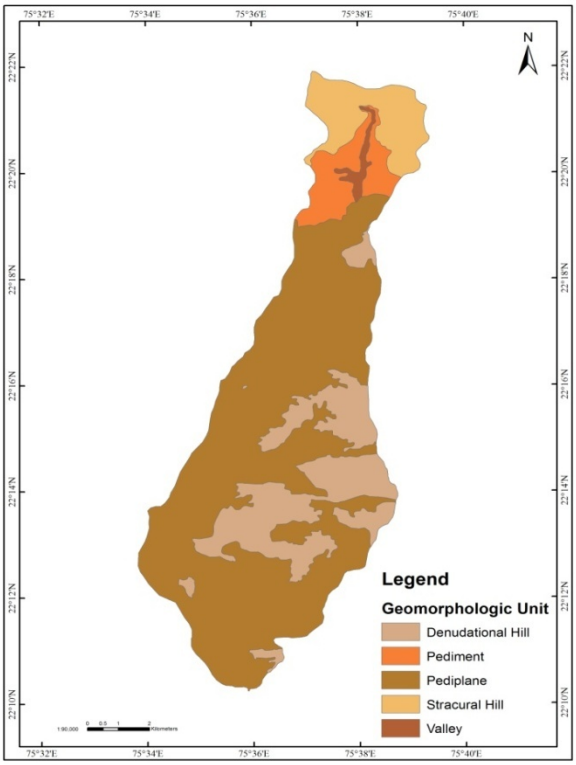

Figure 3: Geomorphology Map

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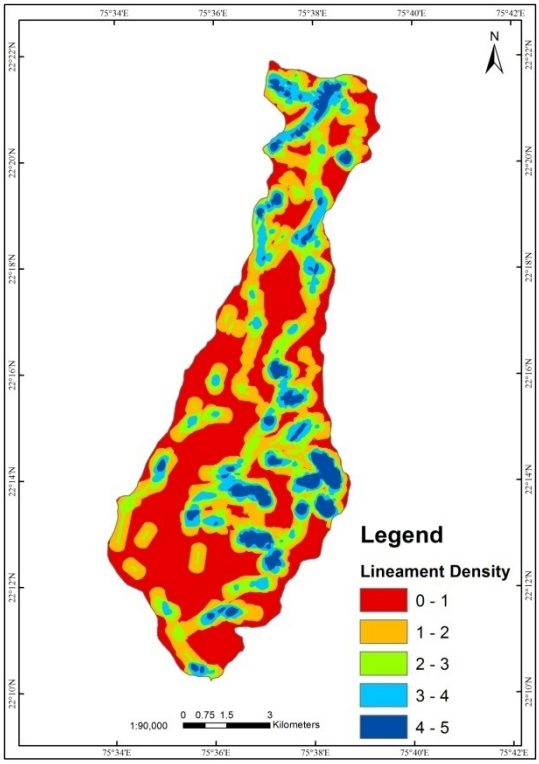

Figure 4: Lineament Density Map

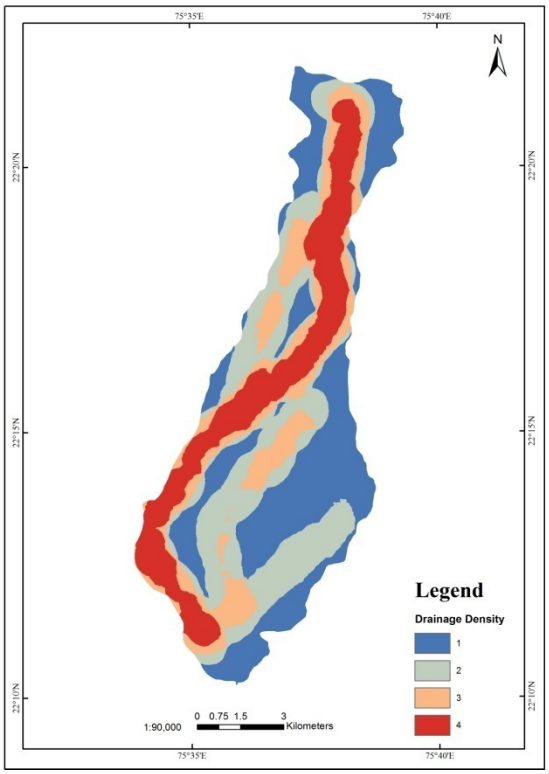

Figure 5: Drainage Density Map

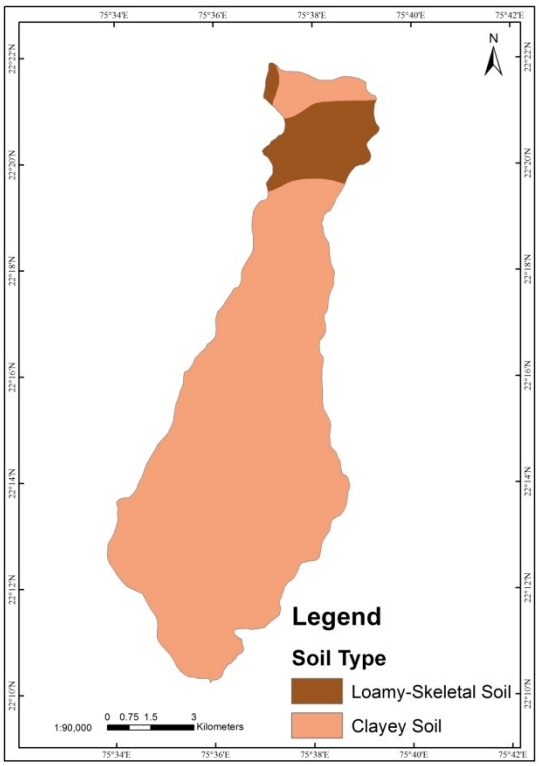

Figure 6: Soil Map

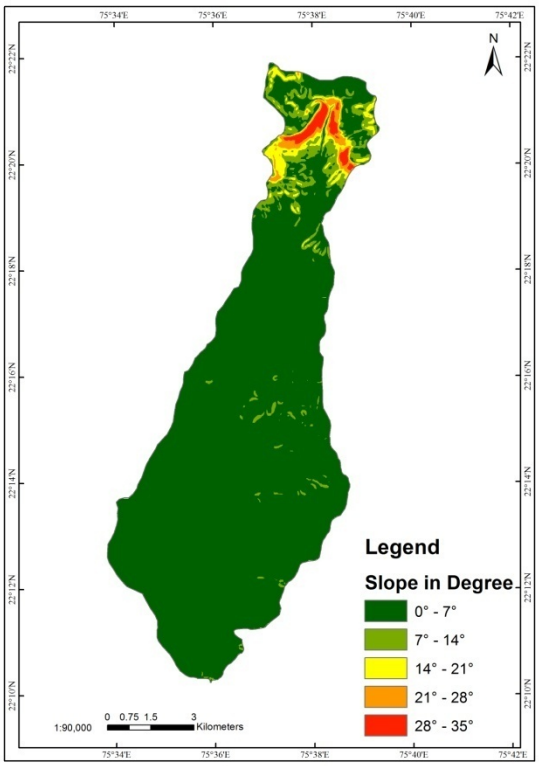

Figure 7: Slope Map

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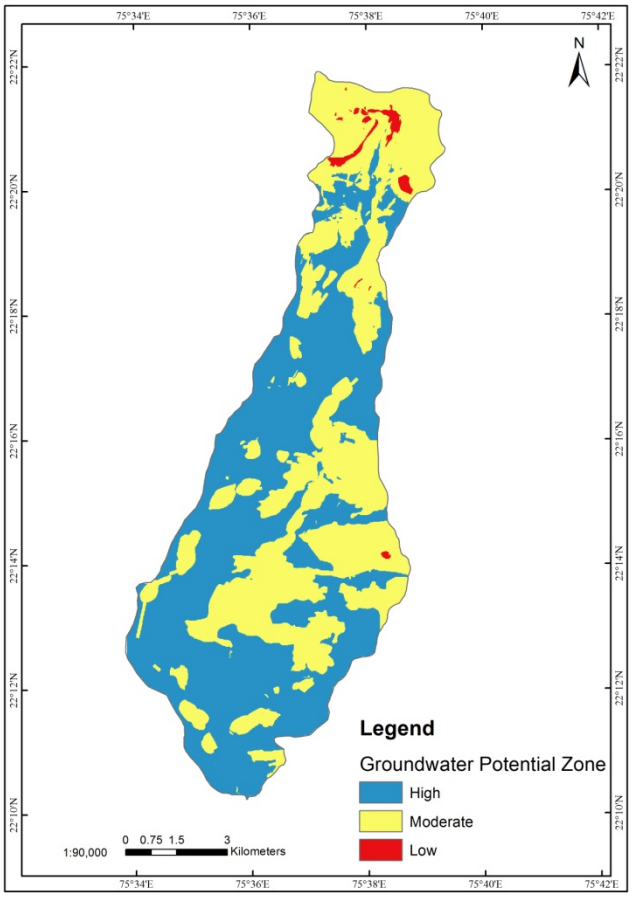

Figure 7: Groundwater Potential Map

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