Ethnomedinal use of Herbs in District Rajouri of Peer Panjal Region of Himalaya Jammu and Kashmir

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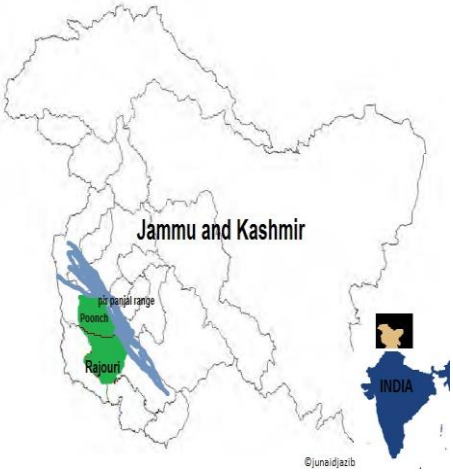
Abstract :- The ethnomedicinal survey was carried out in Rajouri District and its adjoining areas of Peer Panjal Himalaya for documentation and information from local tribal communities (Gujjar and Bakerwals) about the ethno-medicines uses of herbs. The indigenous knowledge of local uses of herbs by these tribal communities was collected through personal interviews during field study. A total of 25 plants herbs belonging to 20 families were recorded used to treat different categories of ailments by different parts of plants, mostly used part is root followed by leaves. Traditional knowledge increases with age and it's higher in elders' then young people due to modernization.

Introduction :- Traditional knowledge of ethno medicinal use of herbs to cure diseases is in practice from time immemorial i.e. at the time of Vedas and Upanishads and other historical holy books such as Holy Quran and Holy Gita. Especially the present study were carried out in Jammu and Kashmir Himalaya where tribal peoples used to live mainly Gujjar and Bakerwal are the true tribal having good knowledge of indigenous uses of herbs and herbal products to cure disorders. The Himalayas are rich repositories of biodiversity. The Jammu and Kashmir region, which is a part of the western Himalayas, has about 2000 species of angiosperms, 12 species of gymnosperms and 90 species of pteridophytes. The physiographic features of Peer Panjal region is mostly hilly terrains and these tribals are poor peoples and spend most the time in forest and hills where there is no dispensary or hospitals available in such conditions these tribal's relay on herbs as their medicine to cure their ailments. The ethnobotanical knowledge and practices are also in danger in this region as in many others. The loss of traditional knowledge in a culture that is undergoing a rapid change is as reversible as the loss of plant species 3. Therefore efforts should be made to document the ethnobotanical knowledge and practices before much of it is lost forever. During the study it was noticed that the traditional knowledge is higher in elder peoples as compared to new young generation factors

are many such as change in lifestyle from nomads to settlers also shift in belief system due to modernization etc timely care about this concern is necessary. As per World Health Organization (WHO), nearly 80% of the world inhabitants, especially living in the rural areas of developing countries, rely mainly on traditional medicines for their primary health care (WHO, 2003). There are several areas world over where a vast knowledge on the use of plants against different illnesses exists. In fact, medicinal plants and their traditional uses have been an integral part of social, Cultural, religious aspect of ancient civilization (Folke, 2004). A variety of herbal products have been used by the herbal doctors for the treatments of various diseases common in the area. Traditional phototherapy for the treatment of various diseases is still prevalent amongst the Gujjar-Bakerwal tribe of Peer Panjal regions.

Materialsand methods :- The present study were carried out in Rajouri District and its vicinity areas of Peer Panjal region of Jammu and Kashmir Himalaya Rajouri district is bounded by Poonch district in the north side, Jammu district in the south side, Udhampur district in the east side and Pak occupied Kashmir (Mirpur area) in the west side. Rajouri district with an area of 2,630 Sq. Kms. It is located on the Southerly foothills of Pir Panjal Himalaya in the State (J&K) with an altitudinal ranges from 450-4500m above mean sea level(msl). Being situated in the border areas in the Jammu region and having a topography of difficult and hilly terrain, the district is economically poor and industrially backward. Study includes extensive field trips and interviews with local tribals (nomads) including semi structured questionnaires personal talks with elder peoples of the community.



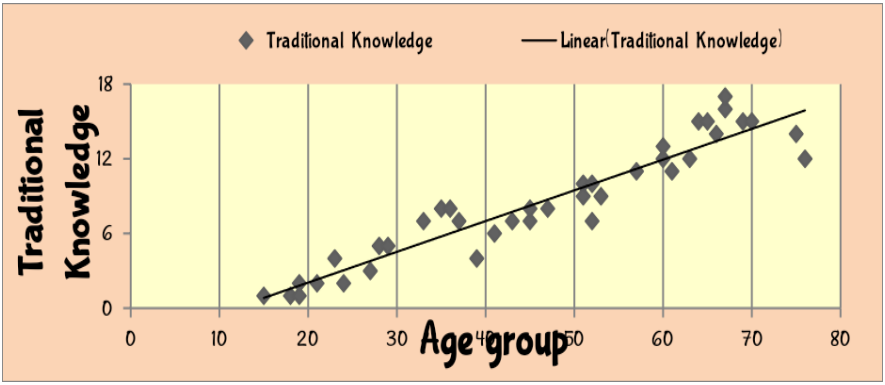
Results :- During this period 25 ethno-medicinal herbs belonging to 20 families has been reported used on different ailments mentioned in the table. It is also analyzed that the traditional knowledge decreased in new generations due to few factors like modernization and shift in belief system shown in graph.

SN.	Herb name	Vernacula r name	Family	Part used	Used against	Method of preparation
1	Abrus precatori us	Ratti	Fabacea e	LeavesR oots and seeds	Skin diseases and stomach pains	Leaves are grounded with lime and applied on effected area. Paste of root is administered to cure stomach pain.
2	Achillea millefoliu m	Madro	Asterac eae	Leaves	Toothache	Leaves are chewed to get rid of toothache and gum problems.
3	Achyrant hes aspera	Phut Kanda	Amaran thaceae	Root, Leaves	Paralysis, Abdominal pain	Root powder taken with glass of milk, Extract leaf juice and taken with glass of water
4	Aconitu m heteroph yllu m	Patrees	Ranuan culacea e	Root	Arthrits	Root powder is used with mustard oil and applied on arthrits. Also taken with water to cure abdominal pain fever and headache.
5	Angelica glauca	Choro	Apiacea e	Root	Fever	Tea prepared fromthe root is given to the patient.
6	Asparagu s racemos us	Sanspai	Asparag aceae	Root	Intermitten t fever and weakness	One cup of juice made from crushed tuberous roots is given on empty stomach once in a day.
7	Bergenia ciliate	Zakhme Hayat	Saxifrag aceae	Leaves, Roots	Diarrhoea, Earache	The juice of the leaves is used as drops to relieve earaches. The root is used as a tonic in the treatment of diarrhea.
8	Cichoriu m intybus	Kasni	Asterac eae	Roots, Leaves	Anti-inflammato ry,	Roots and leaves are dried and powdered also juice is prepared to cure

					rheumatism	rheumatism and inflammation.
9	Curcuma aromatica	Akal-mach	Zingiberaceae	Rhizome	Injury, wound	A spoon ful fine powder of rhizome is given with Ghee (milk and fat)
10	Cyperus rotundus	Deela	Cyperaceae	Rhizome	Malarial fever	Decoction of rhizome with stem bits of Tinospora cardifolia and dried ginger is given to treat malarial fever.
11	Dioscorea bulbifera	Kala ganda	Dioscoreaceae	Tuber	Diabetes	The slices of the tuber are cooked and given with meal once in a day for one week.
12	Duchesnea chrysantha	Mavo	Rosaceae	Whole plant	Hypertension	50ml of infusion fromwhole plant is given twice or thrice in a day.
13	Erigeron bonariensis	Asthma weed	Asteraceae	Leaves	Heart burn sensation	Leaves are powdered and taken to cure of said disorders.
14	Euphorbia hirta	Jatli dodal	Euphorbiaceae	Latex, Stem leaves	Cough Asthma Bronchial infections	Juice/latex of the plant is given in cough (in small quantity); decoction of the plant is given in bronchial infections and asthma
15	Euphorbia	Thor	Euphorbiaceae	Latex	Anthelmintic	Milky latex is anthelmintic and cathartic.
	royaleana				and cathartic	
16	Habenaria intermedia	Singi-buti	Orchidaceae	Root	Diabetes	Roots are crushed and taken to cure diabetes.

17	Hedychium coronarium	Jungle haldi	Zingiberaceae	Rhizome	Abdominal Pain	Powder of dried rhizome mixed with vegetable and cooked and then given along with food
18	Nasturtium officinale	Chho	Brassicaceae	Leaves	Cold,Cough Blood purifier	Leaves are cooked as vegetable to cure cold cough and fever.
19	Oxalis corniculata	Peeli Khati bhuti	Oxalidaceae	Whole plant	antiscorbutic, scurvy, stomacdhic;	Herb is used as cure for scurvy, leaves refrigerant, antiscorbutic and stomacdhic; fresh juice of plant given in dyspepsia, piles and anemia; infusion of leaves used to cure opacity of the cornea.
20	Polygonatu m multiflorum	Chario	Asparagaceae	Leaves	Headache, Fever, Piles	Cup of tea made fromleaves of this herb is useful against headache and fever. The powdered roots are used against piles.
21	Ranunculus sceleratus	Khand Barian	Ranunculaceae	Leaves and seeds	Leaves and seeds	Fresh leaves extract and seed extract is used as tonic
22	Rheum emodi	Pambechari	Polygonaceae	Rhizome	Fructure wound	Rhizome is powserd and applied on wound and fructure to heal up.
23	Sida cordata	Bhiunli	Malvaceae	Leaves	Cuts Diarrhea	Poultice of leaves applied to cuts and bruises, leaves given to pregnant women to treat diarrhea.

24	Sonchus arvensis	Sonchus	Asteraceae	Roots, Leaves	Cough, asthma, bronchitis and whooping cough	Roots are crushed and taken to get relief fromall these cmplications.
25	Viola odorata	Banksha	Violaceae	Leaves	Cold Fever and throat infections.	Decoction of the leaves is used in cold, fever and throat infection in winters



The graph showing traditional knowledge is higher in elders' peoples then younger or traditional knowledge increases with age.

Discussion :- In the present study conducted in the Rajouri district and adjacent rural area. It was observed herbs and herbal products are backbone of remedial for all tribals and hilly areas peoples but traditional knowledge as well as important medicinal herbs such as Aconitum heterophyllum, Asparagus racemosus Angelica glauca Hedychium coranoram Bergania ciliate etc and many more also decreasing continuously. There must be awareness programs to save these threatened herbs and also traditional knowledge. Root is highly used part followed by leaves and then other parts on smaller scale.

Conclusion :- This present survey reported that the indigenous usesof herbs as medicines are still in practice among the local communities especially Gujjar and

Bakerwal tribe other such as Paharies also use herbs as medicine. Although its knowledge is higher among elders and reduced in new generations or we can say traditional knowledge increases with age.

Acknowledgment :- The Author wish to thank a special word of remembrance and gratitude to the people of study area particularly to the Gujjar and Bakerwal tribal peoples of Rajouri district, J & K for providing me support in the field and sharing important ethno-botanical knowledge. Author would also like to thank a special word of remembrance and gratitude to the cordially grateful to UGC MOTA for financial assistance.

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Diversity of Angiospermic Plants in Relation to Human Health

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Abstract :- Floristic diversity refers to the variability of plants in a regions, country or the entire globe. Hence assessment of floristic diversity will help in monitoring as well as recording potential plant genetic resources, economic plants, status of rare and endemic plants in order to formulate strategies for their available conservation and sustainable utilization. The knowledge of the floristic composition of any place is essential and pre- requisite for the study of various eco-system. This necessitates a worker in the taxonomic field to asses and evaluate from time to time the floristic composition of the region.

Keywords :- Sustainable utalization, Human Health, Economic Plant.

Introduction :- In India, from ancient times, different parts of medicinal plants have been used to cure specific ailments. Today, there is wide spread interest in drugs derived from plants. This interest primarily stems from the belief that green medicine is safe and dependable, compared with costly synthetic drugs that have adverse effects. Hence, there is need to screen medicinal plants from promising biological activity.

Plant have been the major source of drugs in medicine and other ancient systems in the world. Traditional medicine or folk medicine practice based on the use of plants and plant extracts. Many plants are used in medicine for the treatment of skin disease, leprosy, lung complaints, leucorrhoea, heart disease, cough, asthma, piles, ulcers, gonorrhea and rheumatism.

The bark, leaves and fruits of this group are used as astringent, haemostatic, anti-spetic, anti-inflammatory, antioxidant and anticancer agent and also in the treatment of diarrhea, dysentery and in the treatment of skin diseases, leucorrhoea, menorrhagia and deficient lactation.

Plant and plants based medicaments have been employed since the dawn of civilization for prolonging life of man by combating various ailments.

Material and Methodology :- During the present work study site (Jabalpur) extensively survey for Ethno medicinal plants using various diseases. Time period for the present work from 1st January 2010 to 31st December 2011. Covering the all season plants have been collected & methodology is adopted as of Santapau (1955), Jain & Rao (1976). During the visit elderly and experienced men and women and medicine man (Vaidyas, Kavirajs) were interviewed for the first hand information uses of the plants were reported and cross queries were made for conformation and verification of the information. Specimens were taken for recording the medicinal information the curative potentialities of which were confidently claimed by the informants. The specimen were identified with Indian literature (Ambasta 1986, Anonymous 1948-76 Chopra et al. 1956, Jain 1991, Kirtikar and Basu 1935) and published research paper on ethno botany of districts adjoining Jabalpur district (Oommachan et al 1986) (Oommachan and Manish 1987), (Oommachan et al 1989 a, b, Oommachan and Manish 1991, Oommachan 1992) and (Mukharjee 1984 and Verma et al. 1985, Pnigrahi and Murti 1989) and deposited in the herbarium of State Forest Research Institute, Polypather Jabalpur.

Enumeration of Plants :-

Aloe vera(L) (Gwarpatha) Liliaceae  Uses:- Rheumatism ,Cough and Cold, Constipation and hepatic disorder. Vermifuge, Hypotensive and commonly applied on burn surfaces.	Allium sativum (L) (Lahsun) Liliaceae  Uses:- Malarial fever, Epilepsy, Tuberculosis, Ulcer, Ear troubles, Skin disease, Bone ulcer, Chronic cough, Asthma, Gangerne of lungs.

Adhatoda vasica (P.miller) (Adusa) Acanthaceae  Uses: Juice made from bark and leaves are used as vermifuge.	Allium cepa(L) (Pyaj) - Liliaceae  Uses: Dysentery, Piles, Bronchitis, Ischaemic heart Disease, flattulance, Anti tumor, Also useful in jaundice, Gum swelling, Night blindness
Atropa belladonna(L) (Nightshade)-Solanaceae  Uses :The medicinal properties of Belladonna depend on the presence of Hyoscyamine and Atropine. The root is the basis of the principal preparations of Belladonna to treat cough and cold.	Abutilon indicum (L) (Kanghi) Malvaceae  Uses: Dried seeds is used as purgative. Roots are taken as infusion in fever.

Aconitum napellus (Bruhl) muk. (Atis) Ranunculaceae  Uses:-Liver disease, Worms infection, Rhinitis, Diarrhoea, Antidote & Malarial fever,	Azadirachta indica A. Juss (Neem) Meliaceae  Uses: Bark : Hypoglycaemic, Rheumatism, Malarial fever skin infection & Blood purification.

Butea monosperma (L) (Dhak) Fabaceae  Uses: Intestinal worms, Seeds in scabies, Pruritus, Ringworms, Gum useful in Diarrhoea & Dysentery.	Bixa orellana (L) (Annatto tree) Bixiaceae  Uses : to make body paint, especially for the lips, which is the origin of the plant's nickname, lipstick tree.

Results and Discussion :- The study could help in conservation, prioritizations of economically and medicinally important threatened plants of Jabalpur. Trees not only assimilate carbondioxide and release oxygen but also play an important role in trapping obnoxious gases and particulate matters in the air. If the global warming is not controlled in due course of time many important Angiospermic flora will be extinct, from the environment. Plants Produce vast of O2 water vapors & absurdity Co2 works against harmful climatic changes & supports all life forms on earth so these one called the lungs of earth.

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Herbal Plants as Immunomodulators

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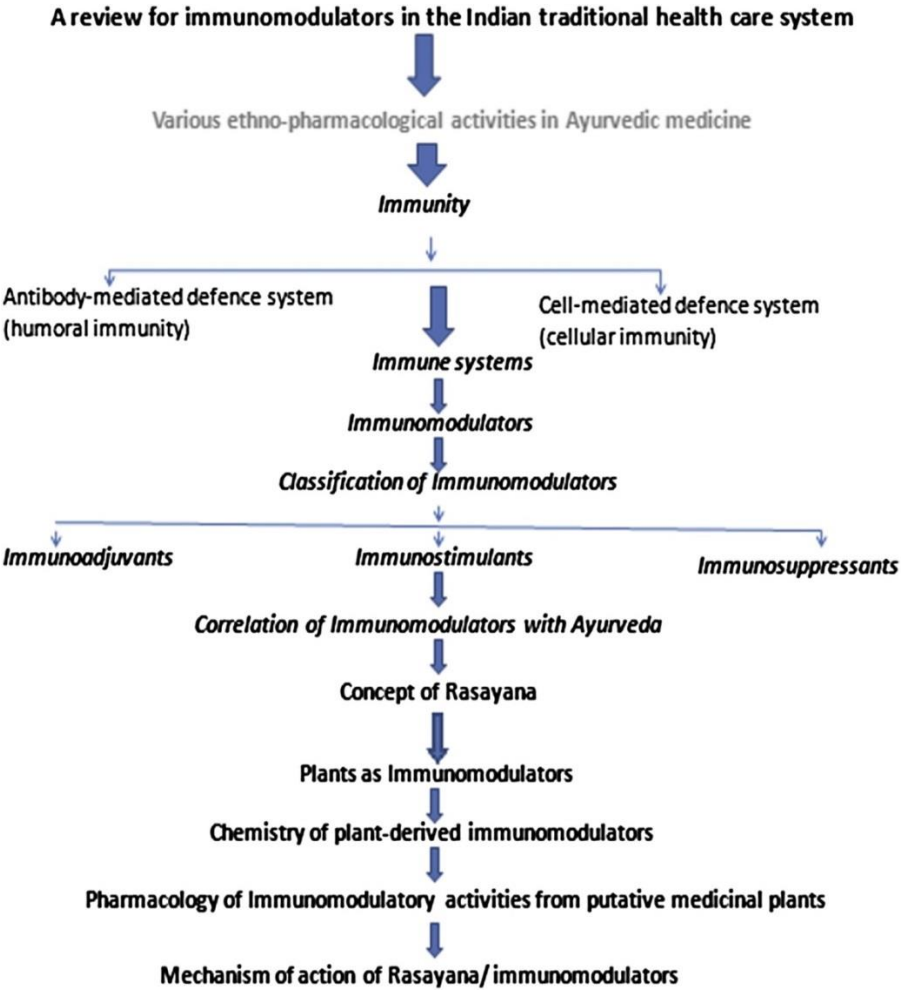
Abstract :- Herbal plants valued in Ayurvedic Rasayana for their medicinal potential. Immunotherapy or biological therapy is the treatment of disease by activating or suppressing the immune system. Immunomodulators are medications used to help regulate or normalize the immune system. Clinically, immunomodulators can be classified into the following three categories: Immunoadjuvants, Immunostimulants and Immunosuppressants. Use of some traditional medicinal plants are proposed to fight against Covid-19. There are many herbal plants which shows immunomodulating activity at a particular dose. So we can prepare the plant based immunobooster which activates the immune system and helps us to prevent the infection from COVID-19. There is a need to evaluate and screen the plant extracts libraries along with semi synthetic modifications .Innovative strategies must be developed to improve the process of plant collection, bioasaay screening and compound development must be employed. Finally, we can say that there is a great potential for the discovery of specific immunobooster from Indian medicinal plants.

Keywords :- Medicinal plants, Immunomodulator, Antimicrobial.

Introduction :- The concept of ayurveda is revived here. Ayurveda focuses on the use of plant based medicines and treatments. We can induce the concept of ayurveda into it and strengthen our immune system. There are two folds of ayurvedic objectives- to cure the disease of a person and to maintain the health of a healthy person. Goals of the ayurvedic treatment includes elimination of impurities, reducing symptoms, increasing resistance to diseases and reducing worry in patient's life. Patients may combine several herbs to increase the resistance against diseases and increases the immune power. The aim of this review is to highlight the results of the plant based immunomodulators having potential immunomodulatory activity[1]. Ayurveda is devoted to 'Rasayana' drugs to enhance body resistance[2-5]. Plant resources are the integral part of human society. After fulflling the basic needs like food and shelter, humans search for a suitable remedy among plants for curing various diseases[3]. Traditional medicine is used to maintain health and to prevent the

diseases. The mechanism of immunomodulator in Ayurveda is depicted through flow chart[4].

TABLE 1 : Mechanism of action of immunomodulators in Rasayana.



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Methods

Ethnobotanical Data Collection :- Therapeutic activity can be estimated by the measure of plant secondary metabolites. Immunomodulators involves a multidisciplinary approach combining botanical, phytochemical and biological approaches[12]. Herbs used against Covid-19 proves effective is a matter of historical evidences and legacy. India have vast number of medicinal plants showing antimicrobial properties. To obtain the active compounds of plants-first make the crude plant extract and it undergoes analyzation through various chromatographic methods.

Plants Proved Effective Against COVID-19 :-

- **Onion/ Allium cepa** : Onions have antioxidant activity due to the presence of flavonoids and organo sulfur compounds. Onion shows the presence of proline which is responsible for proinflammatory cytokines and shows antiviral effect against certain viruses[4].
- **Long Pepper/ Piper longum** : Piper contains piperine which act as a stimulant to modulate the immune response. It is beneficial against asthma and cures several other respiratory problems. It can be taken along with ginger to avoid the liver problems[5].
- **Guduchi/ Tinosporia cordifolia** : It is considered as "Rasayana" in Ayurveda. It is consider as drug which can improve body resistance power. Immunostimulatory activity was assessed by lymphocyte proliferation and macrophage activation assays. Fresh guduchi stem/leaf, guduchi satwa and guduchi capsules were also analyzed for the presence of guduchi ImP. Its chemical constituents help to fight against virus through preventing fusion or adsorption[6-8].
- **Tulsi/ Ocimum sanctum Linn.** : Tulsi is a wonder herb that is much favoured by Ayurveda. This aromatic leaf can be your primary line of defence against COVID-19. Tulsi or basil is a powerful germicide. Simply chew a few leaves first thing in the morning. You can also add a few drops of water boiled with tulsi leaves into your food. It contain essential oils such as eugenol which have carminative, stomachic, antispasmodic and antiasthmatic peoperties.
- **Chamomile/Matricaria chamomilla** : It boost the immunity as it is a immunoactivator.

- **Tea leaves / Camellia sinensis** : It contains Epigallocatechin gallate, quercetin, gallicacid and it acts as an anticancer activity, lipid lowering activity, anticataract activity[11].
- **Ginger/ Zingiber officinale** : Ginger has been an age-old remedy for flu and the common cold. It can also be effective against COVID-19. It contains gingerol – an antioxidant that can power up our immune system and kill viruses. Ginger is particularly good in preventing respiratory tract infections. Add ginger to your meals or you can also have it raw.

Treatment Using Plant Parts :- Different plant parts are harvested by botanists for the preparation of traditional remedies. The most widely accepted and used plant part were roots i.e. 31.4% [9] followed by leaves i.e.24.4% [10]. Roots of various plants proved effective against various common ailments.

Conclusion :- This review emphasis on prevention done against covid-19 using common herbal medicinal plants. Herbal formulation is regarded as positive immunomodulator. There is need to screen the herbal plants in the forest since India is one of the 12 leading biodiversity and placed on a gold mine of well practiced and recorded knowledge of traditional herbal plants[3]. Conservation of forest by the local bodies, tribal people is crucial to avoid the further loss and to increase our traditional knowledge.

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Water Consequences on Humane History as in Amitav Ghosh's novel the Hungry Tide

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Abstract :- Water has a significant role in the development and destruction of the coastal region between India and Bangladesh known as the Sunderbans. Amitav Ghosh's novel The Hungry Tide explores all the realities and circumstances of the region i.e. Sunderbans depends on the existence of water. In this paper, through the symbol of water I want to explore the power, anger and value of Nature. In Hindu mythology, water has an important existence. Water is a natural symbol related to fertility, immortality, place, creation and the feminine. Water is a symbol of Nature. It gives existence to humanity as well as destroyed their life. All creatures of the world totally depend on the existence of water. Through the story of Piya and Fokir Amitav Ghosh in The Hungry Tide wants to show the power of water. The man-eating habit of the Sunderbans tigers has also been attributed to the material properties of the water. Saltry water of the area damage kidney and liver, making the tigers irritable. Amitav Ghosh in his novel The Hungry Tide uses water as a symbol of Nature to express Hindu mythology, significance of river Ganga, endangered river Dolphin and Mangrove forest in Sunderbans area, human history, relationship, remind environmentalists of their own human nature.

Keywords :- Water, Hindu mythology, Nature, Conservation, Humane History, Sunderbans.

Research Paper :- Nature has always proved to be stronger than man. It has often shown its power by controlling manpower through natural calamities like famine, drought, flood, earthquake etc. Man's life and nature are so interlinked that it is not possible for human beings to separate themselves from its influence.

Bordering the Indian Ocean and its vicinity, mangrove vegetation is found in the Sundarbans in the estuary of the Ganges, Brahmaputra system, the Andaman Islands and the Irrawaddy delta. Small remnants of mangroves are also found in the estuaries of the Mahanadi, the Godavari and the Krishna on the East coast. The west coast mangroves can be divided into two forms the open scrubby mangroves of the

Kutch and Saurashtra coasts and the close forests extending from the mouth of the Narmada and Tapti southwards in the Karnataka and Kerala states. The southern part of the Gangetic delta situated between the Hoogly River on the west and the Meghna on the east represents the Sundarbans. Sundarbans is on the biosphere reserves of India. Sundarbans is the largest mangrove forests of the world with an area of over 15,000 sq. km. It consists of a number of low lying swampy islands formed by principal tributaries of the Ganga River. Its central and Western portions are occupied by extensive mangrove forests.

The Sundarbans area experiences scarcity of fresh water due to the shifting course of the Ganga. Consequently, species like Sundari (Heritiera formes) and a small palm (Nypa fruticans) are disappearing. The sea-date (Phoenix paludosa) is found all over the delta but always at the edge of the water. The greatest concentration of mangroves is in the Sundarbans. The essential conditions for the development of mangroves are a warm climate ranging from semi-arid to wet type, periodic flooding by tides and protected shore.

The mangrove dominated Ganges delta the Sundarbans is a complex eco-system comprising one of the three largest single tracts of mangrove forests of the world. Situated mostly in Bangladesh, a small portion of it lies in India. The Indian part of the forest is estimated to be about nineteen percent while the Bangladeshi part is eighty-one percent. Rivers in the Sundarbans are meeting places of salt water and freshwater. Thus it is a region of transition between the freshwater of the rivers originating from the Ganges and the saline water of the Bay of Bengal.

The Sundarbans Mangroves eco-region on the coast forms the seaward fringe of the delta and is the world's largest mangrove eco-system, with 20,400 square kilometer (7,900 sq. meters) of area covered. They have a thick canopy, and the undergrowth is mostly seedlings of the mangrove trees. Though it was extremely difficult to earn a living in the infertile soil of the Sundarbans Islands; they persisted on hunting and fishing, both risky jobs in the tide country.

In Amitav Ghosh's novel The Hungry Tide Piyali Roy (an American biologist), Kanai Dutt (a translator) and Fokir(a fisherman and native of Sunderbans) story shows the power of Nature. Piyali Roy, an American biologist of Indian origin, engaged in research on a rare endangered dolphin which is rumored to be alive in the rivers of the tide country. Mentioning this fact to Piya, Kanai asks, "Do you think

there are fewer dolphins than there used to be?" (The Hungry Tide 266) Piya grimly connects this fact with drastic and disastrous changes in the ecological system and comments, "When marine mammals begin to disappear from an established habitat it means somethings gone very, very wrong" (The Hungry Tide 266-267).

Fokir helps Piya in her research as he has good knowledge about the Sunderbans area. The element factor is very powerful and overwhelms all the characters but nature is not always malevolent, for though Fokir dies, the storm brings Piya and Fokir very close, something that man-made society never had. Even Kanai, who seems a little frivolous, is changed after this experience. Fokir's death can be taken also as the catalytic agent that changes perceptions considerably.

Cyclones and earthquakes will become a common factor taking toll of human and animal kingdom. The novel is left open-ended and the readers are left to ponder over the issue and suggest solutions. There are other hints of similar meaningless exploitation of nature and consequential stasis of human life in The Hungry Tide, the vast waterway of Malta river is reduced to a narrow ditch. This dilapidated state of the river has practically closed the Canning port and people prefer to go to Lusibari through Basonti. Retaining the contemporary perspective The Hungry Tide shows that even the less bountiful natural surroundings are thoughtlessly exploited by man, wreaking havoc on the already precarious ecological balance.

Ghosh contextualizes the great ecological disaster faced by the world today by creating two groups of characters in the novel; one representing those who work to maintain the sustainability of the eco-system and the other, seeking material prosperity with the help of the newly emerging technologies. Those who work for maintaining ecological balance are represented in the novel as spokesmen of deep ecology and those who work for material benefits as the supporters of shallow ecology. Some of the fictional characters introduced in The Hungry Tide serve to highlight the anthropocentric attitude of human beings towards animals. Kanai and Fokir and the villagers of the Sundarbans Island who killed the tiger which strayed into the human habitat are more anthropocentric and the supporters of shallow ecology. They hold the opinion that any animal that obstructs the smooth life of human beings is to be killed. But Piyali Roy values nature independently of its usefulness to humanity and argues for the extension of ethical concern to include all life on earth; not just human life. She holds the opinion that all living and non-living

things exist in relation to each other. Great plan of nature must not be impeded by disastrous human activities. The selfishness and the cruelty showed by the villagers of the Sundarbans Islands towards the tiger pains her a lot. Her compassion towards animals reveals her as a staunch supporter of deep ecology.

In the Sunderbans river Ganga and Brahmaputra do an entwined dance. Dolphins are locally known as 'susu' due to the noise they make while breathing. This species inhabits parts of the Ganga, Meghna and Brahmaputra rivers in India, Nepal, Bhutan and Bangladesh. The Ganga Dolphin is a critically endangered species in India and has been included in the wild life protection act, 1972. According to National Mission for Clean Ganga (NMCG) sources, it would be the country's first national level survey for the head count the Ganga dolphin in river using the direct count method of the international union for conservation of nation. The survey is being conducted as part of the government's flagship 'Namami Gange' programme. Which integrates the efforts to clean and protect the Ganga river.

Amitav Ghosh in The Hungry Tide evocatively describes the ganges Brahmaputra delta. The place where there mighty rivers change form. Ghosh begins with the well-known Hindu legends from the Puranic tradition of Shiva taming the ferocious Ganga in his braids lest the river should have drowned the entire universe. However this region is associated not with the popular part of the legend but with its lesser known later part where there came a point when Shiva's braid was undone and the river separated into hundreds of thousands of tangled strands.

In our legends it is said that the Goddess Ganga's descent from the heavens would have split the earth had Lord Shiva not tamed her torrent by tying it into his ash-smeared locks. To hear this story is to see the river in a certain way: as a heavenly braid, for instance, an immense rope of water, unfurling through a wide and thirsty plain. That there is a further twist to the tale becomes apparent only in the final stages of the river's journey - and this part of the story always comes as a surprise, because it is never told and thus never imagined. It is this: there is a point at which the braid comes undone; where Lord Shiva's matted hair is washed apart into a vast, knotted tangle. Once past that point the river throws off its bindings and separates into hundreds, maybe thousands, of tangled strands. (The Hungry Tide 6)
In The Hungry Tide, Ghosh brings the river and the islands to life through the myth of the Goddess Ganga. Thus legends also go through a process of transition, travelling through the course of history as result of various socio-political dynamics. It is to this

legend that Sundarbans, an archipelago of islands owes its existence and to believe this one has to see it.

Until you behold it for yourself, it is almost impossible to believe that here, interposed between the sea and the plains of Bengal, lies an immense archipelago of islands. But that is what it is: an archipelago, stretching for almost two hundred miles, from the Hooghly River in West Bengal to the shores of the Meghna in Bangladesh. (The Hungry Tide 6)

In Hindu mythology, water has an important existence. Water is a natural symbol related to fertility, immortality, place, creation and the feminine. Water is a symbol of Nature. It gives existence to humanity as well as destroyed their life. All creatures of the world totally depend on the existence of water. Water has a significant role in the development and destruction of the coastal region between India and Bangladesh known as the Sunderbans. Amitav Ghosh's novel The Hungry Tide explores all the realities and circumstances of the region i.e. Sunderbans depends on the existence of water. This paper through the symbol of water shows the power, anger and value of Nature.

Thus we find that Amitav Ghosh in his novel The Hungry Tide uses water as a symbol of Nature to express Hindu mythology, significance of river Ganga, endangered river Dolphin and Mangrove forest in Sunderbans area. Through his novel Ghosh shows human history, relationship, humane values, remind environmentalists of their own human nature, myth and descriptions of the landscape together with the plight of the endangered Ganges dolphin and tiger. Thus humane history is nothing but a mere continuum of myth distinguished from it only by the act of witnessing. Myths have their roots in memory whereas history is the record based on evidence. Through these myths and symbols of nature (especially water), Ghosh wants to aware human about the power and existence of nature. Ghosh also wants to express the rich culture and natural beauty of India through river Ganga and waterways of the Sunderbans.

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COVID-19 : Immunity Analysis and Precautions

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Abstract :- Corona virus disease has restricted all human activities and imposed Lockdown almost in every country of the world. COVID-19 is a kind of viral pneumonia which is caused by Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2). The emergence of SARS-CoV-2 has been marked as the third introduction of a highly pathogenic corona virus into the human population after the Severe Acute Respiratory Syndrome Corona virus (SARS-CoV) novel corona virus and the Middle East Respiratory Syndrome Corona virus (MERS-CoV) in the twenty first century. the is capable of escaping innate immune responses, it can proliferate, unhindered, in primarily infected tissues. Subsequent cell death results in the release of virus particles and intracellular components to the extracellular space, which results in immune cell recruitment, the generation of immune complexes and associated damage. Immunity system needs strengthening to counter virus lateral infusion.

Symptoms of infection emerge during incubation period. Infection of monocytes /macrophages and/or recruitment of uninfected immune cells can result in massive inflammatory responses later in the disease. Uncontrolled production of pro-inflammatory mediators contributes to ARDS and cytokine storm syndrome. The major highlight corona virus infections led to the damage of lungs, while imbalance and excessive immune responses may cause pneumonia. Asymptomatic observation may be spreader.

In this mini review, a brief introduction of the general features, etymology, structure & mechanism of entrance of SARS-CoV-2 is discussed. Immunity in general and immune system along-with immunity boosters is studied. Current knowledge of prevention, diagnosis and treatment of covid-19 is shared. Till date less is revealed about corona virus. However, basic experience of SARS-CoV and MERS-CoV infections may be helpful in offering novel insight and potential therapeutic targets for combating the SARS-CoV-2 infection.

Keywords :- Corona virus, Pathogenesis, Diagnosis, Prevention, Treatment, Immunity, Immunity types, Hypersensitivity, Tolerance, Immunity boosters, Incubation period, Pandemic, Community spread, Quarantine, Isolation, Comorbidity, Syndrome, Social distancing,

Abbreviations :- COVID-19, WHO, SARS, MERS, SARS-CoV-2, SARS-CoV, MERS- CoV, CoV, 2019-nCoV, hCoV, ARDS, ARI, mAb, PPE, WBCs, IVCC, PHEIC, ICTV, ICD, HTK, RBD, FDA, RT-PCR, RCDT, ICMR, NIV, BBIL

Introduction :- Novel corona virus induced pneumonia was named as corona virus disease 2019 (COVID-19) by the World Health Organization (WHO) on February 11, 2020. Disease has rapidly increased in epidemic scale. Until the SARS outbreak in 2002 during which corona virus (CoV) showcased their potential for epidemic spread and significant pathogenicity in humans, they were mainly known as causes of mild respiratory and gastrointestinal disease. COVID-19 has been declared 'Pandemic' by WHO.

Over the last two decades, three novel beta-corona virus viz: SARS-CoV, MERS-CoV, SARS-CoV-2 have crossed the species barrier and caused significant outbreak characterized by high case fatality rates in humans. The latest addition to human pathogenic Corona viruses (hCoVs) is SARS-CoV-2, the cause of covid-19. The International Virus Classification Commission (IVCC) announced that the novel corona virus is named as SARS-CoV-2.

At present, the cases of covid-19 have been found in many countries around the world. At the time of submission of this review SARS-CoV-2 has infected over approximately 13 million people world wide and claimed 575K lives and threatening many more.

On the 31st of January 2020, the WHO announced that COVID-19 was listed as the Public Health Emergency of International Concern (PHEIC), meaning that it may pose risk to multiple countries and requires a coordinated international response. The pandemic virus has now spread to many countries and territories, while a lot is still unknown about the virus that cause covid-19. Currently, limited information is available to introduced the virus or on host factors affecting individual outcomes in covid-19.

Nomenclature and Etymology of COVID-19 :- The name corona virus is derived from Latin corona, meaning crown or wreath, itself a borrowing from Greek kopwvn krone, garland, wreath. The name human corona virus (hCoV) was designated by Ahmeida and Tyrell (virologists) in the year 1968.

The Viruses and the diseases have different names. Viruses are named based on their genetic structure to facilitate the development of diagnostic tests, vaccines and medicines. Virologists and the wider scientific community do this work, so viruses are named by the International Committee on Taxonomy of Viruses (ICTV). Diseases are named to enable discussion on disease prevention, spread, transmissibility, severity and treatment. Human disease preparedness and response is WHO's role, so diseases are officially named by WHO in the International Classification of Diseases (ICD). Here disease was named as COVID-19 or corona virus disease. Virus was named as SARS-CoV-2 or severe acute respiratory syndrome or corona virus. Virus is also recognized by Chinesevirus as named by American President Donald Trump. Some researchers named the virus as Wuhanvirus after the name of Wuhan city of Hubei province. WHO announced COVID-19 as the name of this new disease on 11 February 2020. ICTV announced SARS-CoV-2 as the name of the new virus on 11 February 2020. This name was chosen because the virus is genetically related to the corona virus responsible for the SARS outbreak of 2003. However the related two viruses are different.

COVID-19 :- Corona viruses belong to the Coronaviridae family in the Nidovirales order. Covid-19 is an infectious disease caused by a newly discovered corona virus or by a new strain of corona virus. Formerly, this disease was referred to as 2019 novel corona virus or 2019-n-CoV. Most people infected with the Covid-19 virus experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious illness.

The Covid-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so its important to practice respiratory etiquette. Covid-19 affects different people in different ways. Most infected people develop mild to moderate illness and recover without hospitalization. Generally it takes 5-6 days for infected person to develop symptoms.

Incubation period may be 14 depending on case history. Asymptomatic cases are also being reported nowadays.

Most Common Symptoms

- Fever
- Dry cough
- Tiredness

Less Common Symptoms

- Aches and pains
- Sore throat
- Diarrhoea
- Conjunctivitis
- Headache
- Loss of taste or smell
- A rash on skin, or decoloring of fingers or toes

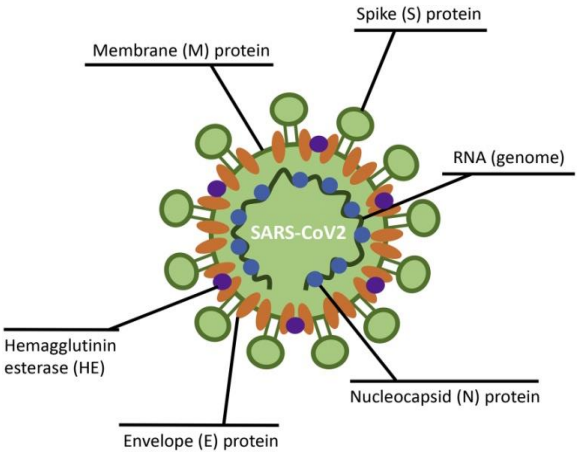
Serious Symptoms

- Difficult breathing or shortness of breath
- Chest pain
- Loss of speech
- Loss of movement

Structure of Corona Virus (Sars-Cov-2) :- CoVs are large enveloped viruses with a single stranded non segmented positive sense RNA genome that spans approximately 30 kb making it the largest known genome of any RNA virus. Being RNA viruses, CoVs readily evolve by mutation and homologous and non-homologous recombination, which expands their host range and facilitates crossing of species barriers. The diameter of genome is 85 nm.

Corona viruses are spherical in shape. Their are club-like projections on the virus surface which are referred to as spikes. Spikes may be 20 nm long. The virus membrane contains four structural components, the spike S, envelope E, membrane M and nucleocapsid N protein. For SARS-CoV and SARS-CoV-2, the S protein is the primary determinant for host tropism and pathogenicity. It is the main target for neutralizing antibodies and therefore of great interest in terms of immunological response and vaccine design. The spike structure is formed by homotrimers of S-glycoproteins, each of which consists of two subunits, whereby S1 forms the part involved in receptor recognition, and S2 is highly conserved, anchors the protein in

the viral membrane and facilitates viral fusion. S1 contains a hypervariable loop which differs greatly between beta corona viruses on both size and sequence. Viral entry requires the proteolysis of the S protein in two locations, a process that utilizes host proteases, and results in irreversible conformational changes of the S protein. Some anti-SARS-CoV antibodies in humans mimic receptor engagement, thus modeling conformational S protein changes upon antigen-antibody interaction. The amino acid sequence of receptor binding sites of SARS-CoV2 is 74% homologous to that of SARS-CoV suggesting similar or even identical cell entry mechanisms for both viruses. The average diameter of virus is 125 nm.



Mechanism of Entrance :- Corona virus binds ACE2 cell surface of epithelial cells in the respiratory tract through its Spike proteins. CoV receptor binding mediates proteolytic cleavage followed by fusion with the host cell membrane. Viral RNA is then released into the host cell cytoplasm, where viral nucleoprotein uncoats. Viral RNA is translated to produce unglycosylated proteins. Proteins are trafficked through the Golgi body where they are glycosylated. Viral capsids assemble from viral RNA and N proteins in the cytoplasm. Vesicles fuse the cell membrane and release CoV virions into the lumen.

The high hACE2 binding affinity of RBD (Receptor Binding Disease) during preactivation of the spike and hidden RBD in the spike potentially allow SARS-CoV-2 to maintain efficient cell entry, while evading immune are surveillance contributing to the widespread of the virus.

Immunity :- The coordination of different cells, proteins, tissues, and organ of immune system provide immunity to the body against infectious organism and other invaders.

All living beings follow survival of the fittest concept and struggle for existence at all stages of evolution. As a part of their struggle for existence living

organisms acquired a defense system known as immunity system comprising of network of cells, tissues, and various organs that work together to protect the body. Blood and lymph systems are important in coordinating the function of immune system, Skin, mucous, damaged skin and mucosal layers are the possible roots of pathogen entry. If the immune system encounter a pathogen (germs, bacteria, fungi, molds or virus) it mounts immune response on the invader. Immune response is sparked by antigen. White Blood Cells (WBC) stored in lymphoid organs are on constant patrol looking for pathogens. On focusing the target they multiply and send signals to other cell types to do the same. WBCs are also called leukocytes.

Leukocytes :- Two categories of leukocytes are :

- **Phagocytes :** These cells surround & absorb pathogens and break them down.
- **Lymphocytes :** These cells help the body remember and recognize past invaders. Lymphocytes are further divided into two categories. B lymphocytes stay in bone marrow and develop B- cells to produce antibodies. T lymphocytes head to thymus and develop T-cells to destroy compromised cells in the body.

Types of Immunity :- There are three types of immunity in human namely :

- **Innate :** This is born level of immunity which attacks foreign invaders and is the first line of defense against pathogen.
- **Adaptive :** This is acquired immunity developed as we go through life. As we are exposed to drugs or vaccines, we develop an inventory of antibodies to different pathogens.
- **Passive :** This is temporary immunity borrowed from other source. Immune system is very complex and may have disorders which are:
- **Immuno-deficiencies :** These arise where one or more organs of the body immune system do not function.
- **Autoimmunity :** Here immune system wrongly targets Healthy cells rather than foreign pathogens or faulty cells.
- **Hypersensitivity :** Here immune system overreacts in a way that damages Healthy tissue.

Immune Tolerance :- Tolerance is the prevention of an immune response against a particular antigen. It is a state of unresponsiveness of the immune system to tissues that have the capability to elicit an immune response in a given organism.

Immune tolerance is important to sustain physiology. Central tolerance is the main way the immune system learns to discriminate self from non self. Peripheral tolerance is the key to prevent reactivity of the immune system to environmental entities.

Immunity Boosters :- Several enriched ways to increase immunity against SARS-CoV-2 are :

- Taking balanced nutritious diet
- Having sound sleep
- Taking Herbs
- Drinking sufficient water
- Doing regular exercises
- Practicing meditation
- Following regular schedule

Prevention, Diagnosis and Vaccination

Prevention :- Prevention is the best cure is a famous phrase. Spread of COVID-19 can be prevented by adhering to few guidelines, which are :

- Wear a face mask
- Wash hands regularly with soap for 20 seconds
- Keep social distancing
- Apply sanitizer
- Avoid going in social gatherings
- Avoid travelling
- Increase immunity

Diagnosis :- COVID-19 patients are generally symptomatic. After the exposure of SARS-CoV-2 symptoms take 2 to 14 days (incubation period) to appear. Recently many asymptomatic cases have been reported who were capable of spreading virus. FDA (Food and Drug Contol Administration) has recommended certain tests for Corona patients. Sampling is done by using a long swab to take a sample from the nose or throat. Sputum sample may also be collected.

Rapid Corona virus Diagnosis Test (RCDT) is recommended for quick results. Accuracy rate of RCDT is 40 %. At Centers for Disease Control, Reverse Transcription Polymerase Chain Reaction tests are performed with 81 % accuracy. FDA has also provided Home Testing Kit (HKT) and Rapid Diagnostic Test (RDT) for people in Self

Quarantine. CT Scan Tests of chest with 98 % accuracy are most dependable for the diagnosis of SARS-CoV-2.

Vaccination :- No vaccine has been developed so far to cure COVID-19. Vaccine development is at clinical test stage. It may further take six months to a year time for a vaccine to be available in market. In many countries, drugs and medicines tried on SARS-CoV and MERS-CoV are being used depending upon type of symptoms. Chloroquine and hydroxychloroquine are being tried in country like India and America. Few countries are using Remedesevir. In India some practitioners are providing Arsenic Album 30 for related symptoms.

For immunity boost up against corona virus, Divya Pharmacy of Patanjali has registered Coronil for oral use. Patanjali has also registered in its Corona kit, Swasari Bati and Anu Talia. Development of vaccine in India is in very advance stage. Indian Council of Medical Research (ICMR) in collaboration with Bharat Biotech India Ltd. (BBIL) will manufacture the vaccine. ICMR has derived it from strain of SARC-CoV-2 isolated by National Institute of Virology (NIV), Pune. Entire world has great aspirations from India, offering precatio for the success of COVAXIN. Made in India COVAXIN is likely to be launched on the eve of 15th August 2020.

Conclusion :- Researchers and Virologists believe corona virus has zoonotic background. COVID-19 is believed to be originated from wet market of Wuhan city, Hubei province, China. In a span of just three months China claimed to manage Wuhan as corona free while the whole world is still striving hard to invent preventive and curative measures to fight against pandemic.

The occurrence and development of SARS-CoV-2 depend on the interaction between the virus and the individual's immune system. Viral factors include virus types, mutation, viral load, viral titer and viability of the virus in vitro. The individual's immune system factors include genetics (such as HLA genes), age, gender, nutritional status, neuroendocrine-immune regulation and physical status. These factors all contribute to whether an individual is infected with the virus, the duration and severity of the disease, and the reinfection.

Although no vaccine and drug has come in market but in the early stages of the epidemic, accurate diagnosis helps control the spread of the disease. It is imperative to develop new, safe, accurate, fast, and simple new technologies for

detecting SARS-CoV-2. Of course, physicians will intentionally intervene in the two factors to make them develop into a direction beneficial to human health, which can help patients recover as soon as possible. However, it must not be considered that medical intervention can achieve a 100% curative effect.

Prevention is always treated as best cure. Strictly following the guidelines can help to control outbreak of SARC-CoV-2 spread. Epidemiological testing alongwith CT scan and RT-PRC tests can help accurate diagnosis.

Patanjali has registered a corona kit comprising of Coronil, Swasari Bati & Anu Talia as an effective immunity booster against COVID-19. ICMR and BBIL will jointly commence manufacturing of COVAXIN.

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Adverse Effects of Traditional Cooking Stove Emissions on Health of Rural Women

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Abstract :- Revelation to traditional cooking stove emission from smoldering of biomass fuel is common in rural areas. Prior studies linked this exposure to an increased risk of chronic obstructive pulmonary disease (COPD), respiratory illness, cardiovascular dysfunction, tuberculosis (TB), genotoxic effects and ocular cells failure in terms of cataracts, dry eye disease and other disorders. Aim to review the alliance between exposure to traditional cooking stove emission from biomass fuel sources in the rural area and adverse health upshots particularly in rural women. Customary cooking stove outflows evidently causes generous sick wellbeing in rural women where most of families depend on unclean energizes for cooking and other family unit exercises, yet there is much outstanding vulnerability. To entangle the effects of cooking stove outflow so as to effectively target intercessions, research is especially required in three regions : (1) the study of disease transmission: case control considers; (2) exposure appraisal: overview plans; (3) interventions: specialized methodologies for improved stoves and ventilations.

Keywords :- Respiratory illness, genotoxic effects, cardiovascular dysfunction, rural women, COPD and ocular diseases.

Introduction :- Approximately one a large portion of the total populace relies upon conventional biomass fuel for food readiness and other family unit exercises (UNDP, 1999). This activity results in exposure to household air pollution (HAP). Biomass smoke is a complex mixture of gaseous air pollutants including respirable small particles. According to Lidia and Junfeng (2002), these chemicals are known perils to human wellbeing; particularly women in light of the fact that the dynamic job of ladies in the improvement of home and family is settled as an essential cook are a well established certainty (Sharma and Dhawan, 1986). Such cooking rehearses, ladies in villages is regularly become a casualty of various different medical issues which related with unclean fuel consuming on customary preparing ovens for food readiness. These traditional cooking stoves generate gaseous air pollutants i.e. NO_2, SO_2, NH_3, O_3 and particulate matter. The resultant exposure to HAP is associated with

respiratory illness (Noonan and Balmes, 2010), cardiovascular diseases (Pena et al., 2017), as well as ocular disease (Pokhrel et al., 2013). This type of vitality is related with elevated levels of indoor particulate matter fixations and an expanded rate of acute lower respiratory infections (ALRI), tuberculosis and chronic obstructive pulmonary disease (COPD). Women and children, who invest quite a bit of their energy inside preparing and getting ready food, are excessively influenced by HAP (Smith, 2006).

Although numerous health risks have been identified in homes and are a public health priority (Bakke et al., 2007). Hazards in indoors are incorporate biological and chemical contaminants just as the impact of physical specialist. Major wellsprings of indoor pollution incorporate burning sources, for example, oil, gas, lamp oil, coal, wood and tobacco items, volatile organic compounds (VOCs), building materials (asbestos), housekeeping items and humidification gadgets, poor ventilation frameworks, an excessive amount of moistness, water penetration or spillage, carbon monoxide (CO_2) and different gases, radon and different toxic specialists (Oliver and Shackleton, 1998; Jaakkola, Yang et al., 2007). Approximations point towards that IAP is linked with 1.5 million mortalities yearly and 2.7% of the globally danger of illness (Singh and Dixit, 2019).

Aim is to find out the fundamental women based investigations that assess the wellbeing impacts of cooking stove emanations in villages. Rural women in creating nations disregard their medical problems. Cooking is done mainly inside with an open fire customary cooking stove and in blackish humid kitchen with poor ventilation framework.

Health Consequences of Cooking Stove Emission :- Conventional cooking stoves outflow impacts enormously rural women wellbeing, mainly the respiratory and cardiovascular systems just as optical system. The individual responses to air toxins fluctuate contingent upon the sort of operator to which individuals are exposed, the level of exposure and wellbeing conditions, and hereditary factor of the individual. Air toxins can cause assortment of impacts on wellbeing, going from biochemical and physiological changes to breathing troubles, hack, and irritation of optical, respiratory and heart issues. It left untreated, those ailments may bring about hospitalizations and even unexpected mortality. Cooking stove emissions affects health in different ways from simple to serious problems such as,

- Particulate matter in the air decreases life expectancy (Apte et al., 2018).
- Pollutants such as ozone gas irritate people's breathing, trigger asthma symptoms and cause lung and heart diseases.
- Exposure to environmental tobacco smoke causes many severe respiratory health problems such as asthma and lung cancer.
- Prolonged exposure to certain air pollutants can even cause infertility according to recent medical researchers (Rajper et al., 2018).

Chronic obstructive pulmonary disease (COPD) :- Long period experience to unclean fuel smolder is evidently linked with chronic obstructive pulmonary disease (COPD) (Kurmi et al., 2010). COPD is characterized by tightening of the airways, but these changes are permanent rather than reversible. The major causative factors to COPD in developing nations are bidi or cigarette smolder and exposure to unclean fuel smoke. According to WHO estimations 700,000 out of the 2.7 million global mortalities due to COPD could be attributable to IAP from unclean fuels (WHO, 2009), predominantly in women. COPD is caused by exposure to gaseous pollutants that generate inflammation, an immunological reaction. In larger airways, the inflammatory reaction is referred to as chronic bronchitis. In the small air cells at the end of the lung's smallest passageways, it leads to emphysema as illustrated in Fig.1. Revelation to air pollutants acts an important character in the increment of COPD and the cause and development of acute exacerbations (Physicians for Social Responsibility, 2009).

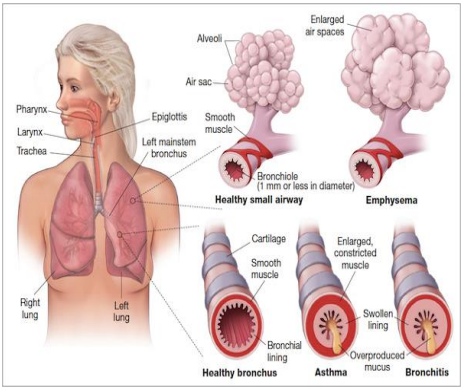

Fig.1: How chronic obstructive pulmonary disease disrupt breathing mechanism in human respiratory system.

Asthma :- Samuelsen et al., (2008) revealed sensitivity adjuvant impact of particles from fuel-wood smolder particles released from wood burning had about like capability to promote adversely vulnerable sharpening as street traffic particles, yet not as much as diesel fumes particles. Intense experience to solid fuel smolder

causes bronchial bothering, aggravation and increments bronchial reactivity that is potentially liable for fuel of asthma (Torres et al., 2008). Unfavorably susceptible asthma is portrayed by reversible narrowing of the lower aviation routes. Pneumonic capacity during an assault shows an obstructive pattern in genuine cases along with diminished ventilation limit which is illustrated in Fig. 2. Allergic asthma may be originated by exposure to IAP acting as allergens. Immunological specific IgE sensitization to an airborne allergen is a significant segment of this sickness, yet vague touchiness is additionally significant for the asthmatic assaults happening on exposure to aggravations in the indoor air (Tsakas et al., 2011).

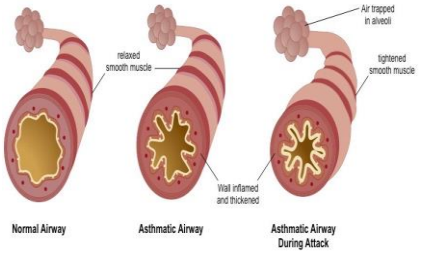

Fig. 2: Difference between healthy and asthmatic alveoli airway in human pulmonary system.

Lung cancer :- Yu et al., in a study distributed in 2015 discovered substantial genomic transformations ascribed to HAP related with coal ignition, in tumor and contiguous typical lung tissues and fringe blood tests from 164 patients with beforehand untreated non-small cell lung cancer (NSCLC) contrasted with patients likewise with NSCLC from different locales with low degrees of HAP coal burning. Other studies also report that NO_2 exposures are positively associated with lung cancer risk (Raaschou et al., 2013; Villeneuve et al., 2014; Cesaroni et al., 2013) and have the strongest associations with all-cause mortality and lung cancer (Jerrett et al., 2013).

Genotoxic effects :- Various investigations have measured DNA harm as an endpoint for the impacts of air pollutants (Vineis, 2005). Fortoul et al., (2011) accounted that genotoxic profiles, demonstrating that air pollutants cause adjustments in the hereditary material of the tried cells for example strand breaks, oxidative harm, adducts and micronucleus. DNA harm could incite changes in any cell from the respiratory tract.

Tuberculosis (TB) :- There is conflicting proof that exposure to unclean fuel smolder expands the danger of TB (Pokhrel et al., 2010; Crampin et al., 2004). The anticipated mechanism is that unclean fuel smolder bargains the respiratory system's capacity to

oppose infection by Mycobacterium tuberculosis or to resist development of active TB in already infected people (Mishra et al., 1999). Similarly, biomass exposure interferes with mucociliary clearance (Houtmeyers et al., 1999) and reduces numerous antibacterial properties of lung macrophages, such as adherence and phagocytic rate (Beck et al., 1982; Fick et al., 1984), giving hypothetical mechanistic reasons to help the likelihood that unclean fuel smolder may be a hazard issue for TB.

Respiratory infection :- Ozone can make harm the alveoli-air sac in the lungs where exchange of oxygen (O_2) and carbon dioxide (CO_2) is delivered. All the more explicitly, the aviation route tissues, which contain countless bio enactment compounds, can change organic pollutants into receptive metabolites, which can cause lung injuries. There is epidemiological proof connecting indoor exposure to air pollutants from the smoldering of solid unclean fuels to pneumococcal disease (O'Dempsey et al., 1996).

Cardiovascular effect :- A planned European study found a 19% expanded danger of stroke related with a 5 $\mu g/m^3$ increment in yearly $PM_{2.5}$, with the most grounded affiliations found among the individuals who had never smoked just as hourly or day by day changes in pollutant concentrations were likewise identified with an expanded danger of stroke and stroke mortality, with a solid relationship between ultrafine particles and stroke mortality (Kettunen et al., 2007). A meta-examination presumed that there was a positive relationship between transient increments in PM and gaseous components and an expanded danger of hospitalization or death from congestive cardiovascular breakdown, with the most grounded relationship upon the arrival of exposure, and progressively constant impacts for $PM_{2.5}$ (Shah et al., 2013).

Effects on Ocular cells :- A wide scope of chemical and biological substances can legitimately influence the optical system and lead to basic damages. It is conceivable that chronic heat exposure is a mechanism by which household cooking and warming flames could actuate cataract, in spite of the fact that this would be hard to recognize from an IAP-incited impact. Another confinement is that most study didn't research the relationship with cataract subtypes. Investigations of the relationship with waterfall were led in India. Dry eye disease, while not a significant reason for visual impairment, is related with considerable visual agony and uneasiness and can prompt fluctuating visual aggravations (Miljanovic et al., 2007; Tong et al., 2010).

Discussion :- A conventional cooking stove outflow is a serious wellbeing peril. Besides, unfavorable impacts on the respiratory system, optical system, and pulmonary functions just as cardiovascular function showed up. The accessible proof proposes that, regardless of heterogeneity among distributed examinations, there is adequate proof and consistency among distributed investigations to presume that exposure to unclean fuel smoke discharge from customary cooking stove is a hazard factor to different illnesses in rural women. This article indicated that the rural women utilizing biomass fuel for cooking experienced respiratory and different morbidities. Cooking stove outflows, a blend of particles and harmful gases, has been unequivocally connected with cardiovascular mortality, asthma, respiratory sickness and visual dysfunction. The way that these harmful gases influence human wellbeing contrarily, their inevitable release into the bigger condition is equipped for adding to the centralization of green house gases in the environment.

Conclusion :- Epidemiological and human examinations all recommend that customary cooking stove outflows are engaged with the pathogenesis of unfavorably susceptible maladies, for example, asthma, TB, pulmonary infection just as heart stroke both as far as their turn of events and compounding. Albeit clashing proof for air pollution as causative in the advancement of hypersensitive illness continues, the unfavorable impact of customary cooking stove emissions is unequivocal and shirking measures ought to be executed.

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Noise Pollution and Human Health Issues a Mutual Co-Relation

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Abstract :- Noise pollution is unwanted sound, it needs to be controlled to make the workplace comfortable. This chapter analyses noise mathematically and the effects of multiple sources are examined. Two noises of exactly the same level can have a combined noise level that is 3 dB higher than the individual values. The greater the difference between the two individual noise sources, the lower is the combined noise level. Different people react differently to the same type of noise. A noise level up to 90 dB does not have any appreciable effect. Exposure in excess of 115 dB is not permitted with unprotected ears as it runs the risk of hearing impairment. The average noise level of various equipment used inside the washery generally ranges from 85 to 110 dB. Various control measures for the abatement of noise pollution have been studied. The hierarchy of control for a reduction of hearing loss to personnel is illustrated.

Keywords :- Noise, Hierarchy, dB, Pollution, Health Issues.

Introduction :- Annoyance from noise pollution is a growing global environmental health problem. Industrialization and higher transport volumes, together with the spatial spread of motorized transport, result in an increase in the number of people adversely affected by industry and transportation noise and air pollution. This is especially true in developing nations. National and city authorities strive to counteract the increase in transport, energy usage, and production of greenhouse gases by densifying city areas. However, increasing the number of people and activities per unit area makes it difficult to come up with good overall noise solutions that also do not have undesirable side effects.

By nature, noise pollution is also a local problem where the characteristics of the noise source vary from situation to situation, from time period to time period, and from country to country. Housing standards, architectural solutions, vehicle and aircraft fleets, human activity patterns, historical, cultural, and natural environments, and differences in climate give rise to important variations in noise and receiver characteristics. Population characteristics and temporal and spatial exposure

patterns thus need to be taken into account when assessing health impacts from noise exposure.

Noise is usually part of a complex environmental exposure situation multisensorially perceived and reacted to both in part and as a whole. In Europe, there is an increased awareness that it is not enough to reduce noise, but quiet spaces and recreational areas also need to be provided where it is possible to escape the noise. However, achieving good sound quality and a supportive environment is a magnitude more difficult than simply reducing high noise levels.

Annoyance is the most prominent adverse effect of noise – associated with exposure to intermediate and high noise levels. Noise authorities in different countries impose environmental limits and provide guidelines to reduce the amounts of noise that their where acoustic assessments are made mandatory. New residential developments and infrastructure projects are often restricted in the noise zones depending on the characteristics of the activities (hospitals, kindergartens). Environmental

Analysis of noise samples :- The data of noise level taken from various industries situated in the industrial area inside/ outside.

Equipment used for noise measurement - Sounds level meter.

After the analysis of the various parameters, the detected values were compared with that of the standard one.

On the basis of the variation in values and the study of questionnaires, the intensity of impact was studied.

Table 4.3.12: Central Board for Pollution Control Standards for Noise

Area	Day dB(A)	Night dB(A)
Silence Zone	51	41
Residential	56	46
Commercial	66	56
Industrial	76	71

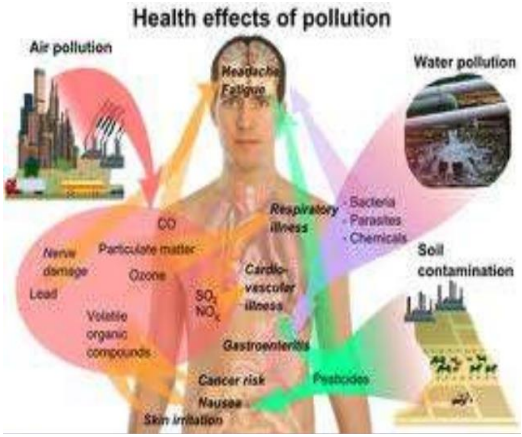
Day Time : 6.00 A.M. to 9.00 P.M
Night Time : 9.00 P.M. to 6.00 A.M

- Silence Zone is defined as area upto 100m around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the competent authority. Use of Vehicles horns, loudspeakers and bursting of cracker shall be banned in these zones.

Health effects of environmental noise pollution :- Exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from

stress, poor concentration, and productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment, tinnitus and hearing loss.

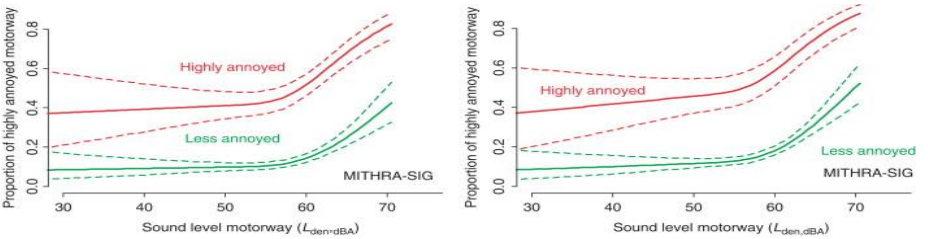
In 2011 the World Health Organization (WHO) released a report titled 'Burden of disease from environmental noise'. This study collated data from various large-scale epidemiological studies of environmental noise in Western Europe, collected over a 10-year period.



The studies analysed environmental noise from planes, trains and vehicles, as well as other city sources, and then looked at links to health conditions such as cardiovascular disease, sleep disturbance, tinnitus, cognitive impairment in children, and annoyance. The WHO team used the information to calculate the disability-adjusted life-years or DALYs—basically the healthy years of life—lost to 'unwanted' human-induced dissonance. Their results might surprise you.

They found that at least one million healthy years of life are lost each year in Europe alone due to noise pollution (and this figure does not include noise from industrial workplaces). The authors concluded that 'there is overwhelming evidence that exposure to environmental noise has adverse effects on the health of the population' and ranked traffic noise second among environmental threats to public health. The authors also noted that while other forms of pollution are decreasing, noise pollution is increasing.

Interestingly, it may be the sounds we aren't even aware we're hearing that are affecting us the most, in particular, those we 'hear' when we're asleep. The human ear is extremely sensitive, and it never rests. So even when you sleep your ears are working, picking up and transmitting sounds that are filtered and interpreted by different parts of the brain. It's a permanently open auditory channel. So, although you



may not be aware of it, background noises of traffic, aircraft or music coming from a neighbour are still being processed, and your body is reacting to them in different ways via the nerves that travel to all parts of the body and the hormones released by the brain.

The most obvious is interrupted sleep, with its flow-on effects of tiredness, impaired memory and creativity, impaired judgement and weakened psychomotor skills. Research has shown that people living near airports or busy roads have a higher incidence of headaches, take more sleeping pills and sedatives, are more prone to minor accidents, and are more likely to seek psychiatric treatment.

But there is another, more serious outcome. Even if you don't wake up, it appears that continual noise sets off the body's acute stress response, which raises blood pressure and heart rate, potentially mobilising a state of hyperarousal. It is this response that can lead to cardiovascular disease and other health issues.

Sound is an important and valuable part of everyday life. But when sound becomes noise, it can negatively affect our mental and physical health. The realities of modern life mean the noises created in our world are not going to suddenly fall silent. Instead, we need to recognise that noise pollution is a serious health concern worthy of our attention, and find realistic and sustainable ways to manage and reduce it—starting with banning those rubbish truck pickups in the middle of the night!

Conclusion :-

1. Workers in noisy industrial environments should be provided with some form of ear protection (ear plugs, ear mufflers and other ear protective devices). Individual monitoring kit can also be given to workers, who work in highly noise area.

2. Highly noise producing machines can be kept in isolated buildings and glass cabin can be provided for the operator.
3. Plantation of trees inside the industrial area is required. Parks should be maintained properly around the houses to reduce the domestic noise pollution.
4. Awareness of people about the hazards of loud sound and restriction on the use of pressure horns, loud speakers and fire crackers shall play an important role in mitigating sound.

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Role of Sustainable Development in Smart Cities for a Better Life Style

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Abstract :- The world is changing and the countries throughout the world are staring at huge population increase. With this gigantic increase in population, rises the problem of over exploitation of natural as well as man-made resources. To deal with the problem, rises the need of sustainability. Governments throughout the world are working to deal with the issue of sustainability and resource preservation for the future. Sustainability goals have been set and we are working to achieve these goals. The Smart City concept is no more a new concept. It proposes a very good solution for the sustainability problem. It aims to make the life and lifestyle of the citizens better and at the same time saving resource utilization and wastage with smart technologies which in turn would increase sustainability.

IoT facilitates smart cities to gather intelligent inputs from the connected devices and sensors. Using this arrangement, smart cities can deal with the pollution and traffic control problems and control both pollution levels and traffic congestions. AI on the other hand, uses AI algorithms to help build intelligent systems through automation and control day to day activities of the municipal boards/Nagar Nigam. Intelligent use of IoT and AI helps in improving smart cities and leads the way for better future of municipalities across the world. This concept pushes towards a smart sustainable city where outdoor parking space, waste disposal management, traffic control and management, public safety, water and power management is smart and efficient.

From making living conditions for city residents better to facilitating cities to be more competitive, IoT and AI are making Smart sustainable city concept a reality.

Keywords :- Smart Sustainable Cities, Internet of Things, Artificial Intelligence, Machine Learning, Information and Communication Technology (ICT), Big Data

Introduction :- These days, taking benefit from IoT and AI based solutions for smart cities aids in accelerating socio-economic growth, improving overall infrastructure and environment process, enhancing transportation model and optimizing the costs of regulating public assets.

Smart City is a concept of using latest technological advances and connected data sensors to enhance and become strong in terms of infrastructure and city operations. This includes monitoring and managing of public domain assets, efficient transportation systems, citizens, power plants, water supplies, information systems, civil bodies and other community services.

With the advent of Internet, the world was happy to be connected together without any physical boundary. The Internet started helping the eager world to connect with static information available but people wanted more from the Internet. Now Internet is helping the world to build links and connections from human to human, human to physical entities and physical entities to other physical entities. The world is changing fast, with a click of a button we are connected to remote sites sharing critical data and information. For example, patients can now take advice from experts sitting in other countries without having to travel all the way.

IBM and IDC have in their papers talked about data generated and its usage and the extent to which there would be usage of Internet and sensor enabled devices by 2030 and how the concept of Smart sustainable cities would be possible [2,3,4,5].

We are living in an increasing technical world, challenging us as human beings.

1. Smartcity :- There is no standard commonly accepted definition which would help to precisely define a Smart City [6]. In simple words, Smart City is an urban area that uses Information and Communication Technologies (ICT) to ease up the livelihood of its citizens. It is a corporation that uses ICT to augment operational efficiency, share information with the citizens and improve both the quality of government services and citizen welfare [7]. According to Technology Strategy Board – IoT Special Interest Group [8], “The Internet of Things (IoT) describes the revolution already under way that is seeing a growing number of internet enabled devices that can network and communicate with each other and with other web-enabled gadgets. IoT refers to a state where Things (e.g. objects, environments,

vehicles and clothing) will have more and more information associated with them and may have the ability to sense, communicate, network and produce new information, becoming an integral part of the Internet."

Another good example that uses this concept is a smart and automated parking application [9] that helps the driver to discover available parking lot spaces quickly without circling of crowded city area around the parking lot. The smart parking application encompasses digital payment which is fast and hassle free.

There are so many places where this evolving concept is being used to gain advantage in. Another good example would be an Internet based AI application which keeps track and manages the Inventory control. Similarly, smoke detector application can help to warn the individual if any smoke is detected.

2. Use Cases For Smart Sustainable Cities :- Let's start with the simplest of question, what makes us declare that a city is "smart"? Going into details further, following are few ways in which AI along with IoT is helping to see and realize the smart city concept [10].

A. Smart Automated Parking :- If we talk of transport and infrastructure in Indian cities, getting a place to park the car is the most difficult task usually. AI and IOT can help in this scenario. There can be display boards displaying the information about parking spaces. Once this vital data is captured, it can be processed for providing actionable insights and real-time parking map [11].

B. Waste and Dump Management :- One of the goals of smart sustainable cities is an environment friendly and a clean city. Most Indian cities are working on this goal under the name of Swach Bharat Abhiyan. With AI working in coordination with IoT, it has become easier for city's civic authorities to remotely monitor waste levels. [12].

C. Public Safety :- This is one of the basic necessities of a smart city. A lot has been done by the governments to make these cities secure and by applying real-time surveillance, data analytics and higher-level decision-making, artificial intelligence (AI) and IoT can help public safety in our cities. [13].

D. Road Traffic :- A major objective of a smart sustainable city is to allow commuters to get from one corner of the city to another safely and as quickly as possible without traffic snarls. To get this goal fulfilled, cities are turning to the use and application of IoT and AI-enable traffic solutions [14].

E. Water and Power :- A developing nation needs regular and affordable water and power supply. By giving them more authority over utilities, AI helps smart cities to minimize costs and the consumption. With AI and IoT, it is possible to regularize the use of water and power in a city. Water and power conservation is possible which will help in sustainability [8].

Summary and Conclusion :- Smart sustainable cities are those urban areas which follow goals of sustainable development. These are the cities which minimize wastage of natural resources and are environment friendly in nature. It is a beautiful and a systematic connected city with wonderful infrastructure, quality education and advanced affordable healthcare facilities. We all would want to be a citizen of this environment friendly smart city having all the facilities and resources at our disposal. Technology has played a major part in making cities smart and sustainable. Smart homes is one of the component of this smart city planning and well known builders are selling smart homes fitted with all the IoT and AI devices that makes the citizens share the facilities even from remote locations and be connected to their families.

We have always been dreaming of smart cities with full interconnectivity of intelligent vehicles, driverless cars along with normal cars and smart hi-tech buses all connected with each other. They are in turn hooked with smart intelligent e-highways, smart traffic lights with sensors and automated vehicle parking lots. The smart sustainable city will work together to change life with a promise of betterment and safety. Smart city will be a fully connected intelligent system that will save human lives through prompt actions, save precious resources continuously and save fuel which is the need of the hour. It has been a dream which is getting fulfilled now. This will soon become a reality which will be possible as the government moves towards requiring technology built into new vehicles in the future which helps in fulfilling the sustainable development goals.

We would want India to progress fast and have unlimited smart sustainable cities. We have the capabilities and the expertise too. It is in the interest of Indian cities to adapt and welcome AI and IoT solutions with positivity and the intent.

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Medicinal Plants for Boosting Immune System

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Abstract :- The Immune system is the most important system in our body. It is essential for our survival. Without an immune system, our body would be open to attack from bacteria, virus, parasites, and more. It is our immune system that keeps us healthy. To live long and be healthy we have to improve our immune system. Plants are the main source of herbal remedies and we have been using it since ancient time to prevent us from different diseases, In this paper I mentioned some medicinal plants that can help us to improve our immune system.

Introduction :- Medicinal plants have been used since immemorial times, for the treatment of different kinds of diseases. Presence of phytochemicals, plants work in the same manner as conventional drugs. Medicinal plants can be used to improve immunity. Our immune system is the most important part of our body. It is made up of different types of cells like, specific cell (macrophages, lymphocytes etc.) Lymphatic organs like thymus, spleen, etc. Our immune system is our natural defence system against pervasive chain of diseases. In present time we live in polluted environment, there are many kinds of bacteria, virus fungi, and harmful UV rays that can causes different kinds of diseases. So it is now important to improve our immune system, to live healthy. There are some medicinal plants that can help us to improve our immunity.

Ocimum basilium (Tulsi) :- Ocimum basilicum commonly known as Tulsi in the Indian houses. In India, Basil is a holy plant, we believe that, basil is our goddess. It is the most common herb which is used in every Indian house for common fever, cold and cough. Basil or ocimum basilicum belongs to lamiaceae family. Basil has an extensive list of traditional medical uses. O. basilicum has more than 50 medicinal uses, from analgesic to anthelmintic, and is supposed to treat fungal infections, acne, headaches, etc. The traditional Chinese medicine system involves the use of O. basilicum for treatment of gum ulcers, kidney problems (Meyers, 2003).Traditionally, basil has been used as a medicinal and aromatic herb, to add

aroma and flavour to food (Vieira, Simon, 2000). In India, it is used in problems as diverse as earache, menstrual irregularities, arthritis, anorexia and malaria (Medical Economics Company, 2000, cited by Meyers, 2003). Danesi et al., 2008 reported that Ocimum L. includes approximately 150 species, possessing a great variation in plant morphology and biology, essential oil content, and chemical composition. In basil there are several pharmacological effects in different diseases, with potent antioxidant, anti-aging, anticancer, antiviral, and antimicrobial properties (Sakr, Al-Amoudi, 2012).

Ginger (Zingiber officinale Roscoe) :- Ginger is very famous and globally used spice. It belongs to the family Zingiberaceae. In Ayurveda ginger is an important part of traditional medicine. (Hrdayam of Srimadvagbhatt, 1999). Ginger is consumed worldwide as spice, flavouring agent, garnish, medicine, and food preservative and is used either freshly in a fresh paste, or dry in a dry powder. Fresh ginger can be substituted for dried ground ginger, although the flavours of fresh and dried ginger are somewhat different. Powdered dry ginger is typically used as flavouring for recipes such as gingerbread, cookies, crackers and cakes, ginger ale, and beer. The fragrance of ginger is penetrating and aromatic. It tastes spicy, hot, and biting and is an integral part of almost all the cuisines of the world.(Bhatt et al.,2013). It is used in various kind of diseases like cold, headache, common fever. In India it is famous for 'Adrak-vali chai'. It has many kind of phytochemicals including phenolic compounds, terpenes, polysaccharides, lipids, organic acids, and raw fibres. The health benefits of ginger are mainly attributed to its phenolic compounds, such as gingerols and shogaols. Accumulated investigations have demonstrated that ginger possesses multiple biological activities, including anti-oxidant, anti-inflammatory, anti-microbial, anti-cancer, cardiovascular protective, respiratory protective, anti-obesity, anti-diabetic, anti-nausea, and antiemetic activities.(Quin t al, 2019). Ginger is a complex substance consisting of more than 60 compounds (Srivastava et al, 2000). Studies shown that ginger stimulates the flow of saliva, bile, and gastric secretions and therefore is traditionally used to stimulate appetite, reduce flatulence, colic, and gastrointestinal spasms, and generally act as a digestive aid (Blumenthal et al, 2000). Gingerols inhibit the growth of Helicobacter pylori associated with dyspepsia, peptic ulcer disease, and the development of gastric and colon cancer (Mahady et al, 2005).

Andrographis paniculata (Kalmegh) :- Andrographis paniculata commonly known as Kalmegh, bhuminimb. It belongs to family Acanthaceae. In traditional medicine, A. paniculata is widely used to get rid of body heat, dispel toxins from the body; prevent

common cold, upper respiratory tract infections including sinusitis and fever (Gabrielian, et. al., 2002) and as an antidote against poisons of snakes and insects (Samy, et. al., 2008). An antioxidant is a molecule capable of terminating the chain reactions that damage cells by removing free radical intermediates, and inhibit other oxidation reactions by thereby reducing stress responsible for many degenerative disorders. Andrographis paniculata Nees, a multipurpose tropical plant is believed to have antioxidant properties (Mishra, et. al., 2013). The characteristic secondary metabolites encountered in this plant have considerably enhanced its importance in the arena of medicinal plants. Plant has various kind of phytochemicals such as such as Alkaloids, Flavonoids, Saponin, Terpenoid, Tannin, Glycosides, Phytosterol, and Proteins.(Pandey.et al,.2019). This plant has been used as bitter tonic, stimulant, and aperients in Ayurvedic and other traditionally known health care systems widely practiced in India and other Asiatic countries (Kumar. et al., 2014). Andrographis paniculata extracts possess anti-stress or apoptogenic properties have often been pointed out by several modern scholars and researchers of traditionally known herbal remedies.

Result and Conclusion :- In this article, we discussed only about the plant which is easily available either in house or near to house. We are living in polluted atmosphere, facing UV rays day to day, using polluted water as well as food. So it is mandatory to improve our immunity to live healthy life, we cannot depend only on synthetic drugs because they can harm us by their long uses. Medicinal plants and herbs are the boon for human life. We should use it in our daily routine. Basil is the queen of herbs, it is easily available in every house. Basil has many kinds of medicinal properties, that is why basil is used most of the time in traditional medicine. Ginger is the second most usable herb in every house. In ginger there are many kinds of phytochemicals that can help us to improve our immune system. Same as Andrographis paniculata which is called little Neem (Azadirachta indica) in such plants phytochemicals like alkaloids, flavonoids, terpenoids, and glycosides are responsible to improve immunity. These plants have antibacterial, antifungal, antiviral properties as well as contain antioxidants.

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कोविड–19 और सामाजिक परिवर्तन

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सारांश :– परिवर्तन प्रकृति का नियम है यह शास्वत सत्य है। आज पूरी दुनिया एक ऐसे परिवर्तन से जूझ रही है जो किसी प्रकृति के द्वारा परिवर्तित नहीं है बल्कि व्यक्ति द्वारा परिवर्तित दशा है। और जिसके कारण परिवर्तन हुआ वह कोरोना वायरस है। इससे केवल एक देश नहीं बल्कि पूरी दुनिया इससे प्रभावित हुई है। प्रभाव इतना गंभीर है कि लाखों लोगों को इस महामारी ने अपनी चपेट में ले लिया है। अभी तक इस बीमारी का कोई इलाज नहीं है। इलाज केवल सामाजिक दूरी बनाने से है। मतलब सामाजिक दूरी बनाकर इसके संक्रमण से बचा जा सकता है।

मुख्य शब्द :– कोविड–19, सामाजिक परिवर्तन, महामारी, उन्माद, सामाजिक संरचना, मानसिक अवसाद, असमानता, आर्थिक संकट, अमानवीयता, पलायन।

प्रस्तावना :– कोरोना संक्रमण ने आज विश्व में जो स्थिति पैदा की है वैसी स्थिति अभी तक इतनी भयानक अवस्था में कोई भी संक्रमण कभी भी नहीं रहा। संक्रमण इतना ज्यादा है कि एक व्यक्ति दूसरे व्यक्ति के संपर्क में आने से संक्रमित हो रहा है। पूरी दुनिया को इस संक्रमण ने घुटने के बल पर लाकर खड़ा कर दिया है। समझ में नहीं आ रहा है कि व्यक्ति किधर जाए। ऐसा नहीं है कि इसके पहले संक्रमण नहीं था। दुनिया इसके पहले कई संक्रमण से गुजर चुकी है। जिसमें प्रमुख रूप से – हैजा, पीलिया, पोलियो, स्वाइन फ्लू, वर्ड फ्लू, इवोला, एड्स आदि है। लेकिन मानव को इतना मजबूरी में किसी संक्रमण ने नहीं डाला जितना कि कोरोना संक्रमण ने, विश्व स्वास्थ्य संगठन ने भी इसको महामारी के रूप में परिभाषित किया है।

परिवर्तन और सामाजिक परिवर्तन में अंतर स्पष्ट किया जा सकता है, परिवर्तन जहां समस्त परिवर्तन (प्रकृति, जलवायु, भौतिक, आर्थिक, राजनीतिक) से लिया जाता है। जबकि सामाजिक परिवर्तन सिर्फ समाज में हुए बदलाव से लिया जाता है। सवाल यह उठता है कि समाज में क्या परिवर्तन हो रहा है या हुआ है.... यह बात स्पष्ट तौर पर दिखाई पड़ रही है। आज समूचा विश्व एक–दूसरे से दूर जा रहा है। आज आदमी–दूसरे आदमी से दूर होता जा रहा है और यही बचाव का रास्ता बचा हुआ है। व्यक्ति–व्यक्ति के संपर्क में आने से संक्रमित हो रहा है। इसीलिए पूरी दुनिया सामाजिक दूरी का पालन करने के लिए मजबूर है।

क्या है कोरोना संक्रमण :– कोविड–19 वायरस अलग–अलग लोगों को अलग–अलग तरह से प्रभावित करता है। यह ऐसा वायरस है जिसके सामान्य लक्षण में – बुखार, सूखी

खांसी, थकान, खुजली और दर्द, गले में खराश, दस्त, आंख आना, सिरदर्द, बेस्वाद आदि है। जबकि गंभीर लक्षण में – सांस की तकलीफ, सीने में दर्द, कमजोरी लगना है। कभी–कभी यह संक्रमण 5–6 दिन में दिखाई देता है और कभी यह 14 दिन में दिखाई पड़ता है, और कभी इसके कोई लक्षण ही दिखाई नहीं पड़ते है। भारत में यह लक्षण ज्यादा दिखाई पड़ रहा है।

कहाँ से आया कोरोना संक्रमण :– आज पूरी दुनिया इस बात का पता लगाने में जुटी है कि आखिर में यह संक्रमण आया कहाँ से। कई शोधकर्ताओं का मानना है कि कोरोना वायरस चमगादड़ से इंसानों में फैला है। शोधकर्ताओं ने इस बात की पुष्टि की है कि संक्रमण चीन के वुहान शहर के मीट मार्केट से फैला है। लेकिन दुनिया के कई विद्धान यह मानते है कि यह चीन की वुहान लैब से बनाया गया वायरस है। लेकिन चीन इन सब बातों को बेबुनियाद बताता है। अमेरिका जैसा शक्तिशाली राष्ट्र इस वायरस का जिम्मेदार चीन को मानता है।

कोरोना संक्रमण का प्रभाव :– कोरोना संक्रमण प्रभाव आज पूरे विश्व में अपना पैर पसार चुका है इस संक्रमण ने दुनिया में कोहराम मचा रखा है लाखों लोगों की जान चली गई है और करोड़ों लोग इससे संक्रमित हैं। जो इस आँकड़े से समझा जा सकता है। 20 जुलाई 2020 तक इसका कितना प्रभाव रहा है वह निम्नलिखित रूप से इन आंकड़ों से समझा जा सकता है।

विश्व पर कोराना का प्रभाव

कुल संक्रमित व्यक्तियों की संख्या	विश्व में मृत व्यक्तियों की संख्या	नए संक्रमित व्यक्तियों की संख्या
14,538,094	607,358	189,236

स्त्रोत :– विश्व स्वास्थ्य संगठन दिनांक – 20.07.2020 रिपोर्ट

विश्व के प्रमुख राष्ट्रों पर इसका प्रभाव

देश	कुल संक्रमित व्यक्तियों की संख्या	मृत व्यक्तियों की संख्या	नए संक्रमित व्यक्तियों की संख्या
अमेरिका	3,748,248	139,964	62,788
ब्राजील	2,098,389	79,488	23,529
भारत	1,155,191	28,084	37,148
रशिया	777,486	12,427	6836
यू.के.	294,796	45300	36053

चीन	14,538,094	607,358	189,236
इटली	244,434	35045	62181

स्त्रोत :– विश्व स्वास्थ्य संगठन दिनांक – 20.07.2020 रिपोर्ट

इन आंकड़ों का विश्लेषण करने से यह बात स्पष्ट हो जाती है कि इस संक्रमण ने पूरे विश्व को अपनी चपेट में ले चुका है। कोई भी राष्ट्र इस महामारी से बचा नहीं है, इस संक्रमण से व्यक्तियों की मृत्यु तो हुई है इसके साथ ही साथ सामाजिक, राजनीतिक, आर्थिक, धार्मिक तथा मानसिक स्थिति पर भी इसका गहरा प्रभाव देखने को मिल रहा है जिसका विश्लेषण आगे किया जा रहा है –

असमानता को बढ़ावा :– कोरोना संक्रमण ने समाज में असमानता को जन्म दिया है। जहां पहले समाज व्यक्ति के सामूहिक संरचना से था। वहीं आज यह समाज विरक्त नजर आ रहा है। विरक्तता में छुआछूत जैसी अवधारणा ने जन्म ले लिया है। एक व्यक्ति दूसरे व्यक्ति को शंका की दृष्टि से देख रहा है। राज्य सरकारें अपने–अपने लोगों को सुरक्षित करने में लगी हैं, जबकि यह काल अपनों एवं परायों से नहीं है सभी मानव है सभी को सुरक्षित रखना सरकारों का कर्तव्य है।

गरीबी में बढ़ोत्तरी :– इस संक्रमण ने सबसे ज्यादा प्रभाव समाज के छोटे तबकों पर पड़ा है। दुनिया में गरीबी बढ़ी है जो व्यक्ति रोज कमाता–खाता था उस व्यक्ति का सारा आशियाना उजड़ गया। समाज में गरीबी बढ़ी है, आज फिर समाज में गरीब और अमीर की खाई काफी गहरी होती जा रही है।

बेरोजगारी बढ़ी :– दुनिया में वैसे ही बेरोगारी विद्धमान रही है, कोरोना संकट काल में इसमें बेतहाशा इजाफा हुआ है। पूरी दुनिया में लगभग काम बंद चल रहा है। लोगों को काम से निकाल दिया गया है या लोग खुद छोड़कर भाग रहे हैं, साथ ही साथ यह भी डर सता रहा है कि किसी तरीके से लांग अपने–अपने घर पहुँच जॉये।

मजदूरों का पलायन :– कोविड–19 का संक्रमण लगातार बढ़ता चला जा रहा है और इसका प्रभाव सबसे ज्यादा मजदूरों पर पड़ा है। मजदूर का काम–काज बंद हो जाने से और लॉकडाउन की वजह से मजदूर अपने–अपने घर वापसी के लिए मजबूर हैं। इस पलायन का रास्ता बड़ा ही कठिन और मार्मिक है। इस संक्रमण ने लोगों को पैदल चलने के लिए मजबूर कर दिया है। चूंकि राज्यों की सीमाएं लगभग सील हो गई हैं इस वजह से यातायात के साधन बंद पड़ गए, जिससे इन प्रवासी मजदूरों को हजारों किलोमीटर का रास्ता पैदल ही चलकर पूरा करना पड़ रहा है। हालांकि केन्द्र के द्वारा, राज्य सरकारों को निर्देशित किया गया है, लेकिन कई राज्य सरकारों के द्वारा इसमें हीला–हवाली की जा रही है। दिल्ली, मुम्बई, हैदराबाद, कोलकाता से हजारों मजदूर अपने–अपने घर लौटने के लिए मजबूर हैं।

मार्मिक विचार यह है कि मजदूरों को घर वापसी को लेकर भी राजनीति हो रही है। यह बात समझ में नहीं आती कि मजदूर तो मजदूर हैं इसमें इन मजदूरों का क्या कसूर है कि वह दो वक्त की रोटी के लिए इन शहरों में आए थे। सवाल यह है कि क्या कभी भी इन मजदूरों से कोई काम नहीं पड़ेगा इनकी आवश्यकता नहीं पड़ेगी, यह तो वक्त ही बताएगा।

मानसिक अवसाद :– कोरोन संक्रमण ने न केवल शारीरिक अवसाद पैदा किया बल्कि मानसिक अवसाद ज्यादा पैदा किया है। व्यक्ति मानसिक रूप से डरा हुआ प्रतीत हो रहा है। और यह डर व्यक्ति के अंदर तक घर कर लिया है। व्यक्ति इस सोच में पड़ा है कि वह क्या करे, क्या न करें। किससे मिलें किसने न मिले, कहां जाए, कहाँ न जाए, यह तमाम उलझने व्यक्ति को झकझोर रही हैं। व्यक्ति अपनों से डरने लगा है। यह क्या स्थिति आ गई है जहाँ लोग अपनो के भावों को भी नहीं ले जाना चाह रहे हैं। इससे बड़ी विडम्बना क्या हो सकती है। इटली, जर्मनी, अमेरिका में तो ऐसे ही हालात बने हुए है। समूचा विश्व इस अवसाद से गुजर रहा है। मन, शक्ति, हिम्मत लगभग टूटने लगा है। आदमी आराम करके, घर में रहकर थक चुका है वह अब इससे बाहर निकलना चाहता है। फिर से उस समाज में आना चाहता है जिसमें सामाजिक दूरी जैसा कोई बंधन नहीं हो। व्यक्ति फिर से वैसा वातावरण निर्मित करना चाहता है जिसमें कोई रोक–टोक न हो। कोई प्रतिबंध न हो। इस प्रतिबंध ने मनुष्य को शिथिल बना दिया है। नहीं तो मनुष्य सदैव गतिशील रहा है। व्यक्ति की सोच, विचार, व्यवहार, तरीका, रहन–सहन सब गतिशील रहा है। 'रूका कब' था? लेकिन अब चहारदीवारी में रहने के लिए मजबूर है। इससे हमें निकलना होगा।

सरकारों के लिए चुनौती :– कोरोना संक्रमण केन्द्र सरकार एवं राज्य सरकारों के लिए एक गंभीर चुनौती बनकर आया है। यह चुनौती कोई सामान्य नहीं है। इस संक्रमण से कैसे निकला जाए यह कौतुहल का विषय बना हुआ है। आज पूरी दुनिया में स्वास्थ्य एक प्रमुख विषय बन गया है। आने वाले चुनावों में स्वास्थ्य एक प्रमुख मुद्दा होगा। चूंकि अभी तक सरकारों का ध्यान इस तरफ नहीं था लेकिन अब होगा। सरकार के समक्ष सबसे बड़ी चुनौती इस संक्रमण से लोगों को कैसा बचाया जाए, लोगों के लिए खाने–पीने, रहने की व्यवस्था कैसे की जाए। सामाजिक दूरी फिस तरह बनी रहे इसकी भी चुनौती इन सरकारों पर है। सरकार लगातार इस दिशा में प्रयास कर रही है। तमाम उद्योग, व्यापार, बाजार, उत्पादन सभी बन्द पड़े हैं यह भी बड़ी चुनौती साबित हो रही है। सरकारें किस तरह से इन सबका पुनः संचालन करेगी यह भी बड़ी चुनौती है। हालांकि व्यापार, बाजार से ज्यादा जरूरी व्यक्ति जीवित रहेगा तो इन सबका उपयोग और उपभोग कर पाएगा नहीं तो कैसे कर पाएगा। सरकारों का दायित्व लोगों के स्वास्थ्य के प्रति बढ़ गया है।

अर्थव्यवस्था पर दुष्प्रभाव :– कोरोना संक्रमण ने जहां एक ओर सामाजिक व्यवस्था पर दुष्प्रभाव डाला है वहीं साथ–साथ आर्थिक व्यवस्था को अतिक्रमित किया है। चूंकि पूरी दुनिया सहित भारत में बंद चल रहा है, ऐसे हालात में अर्थव्यवस्था पर इसका प्रभाव लाजिमी है।

केन्द्र सरकार द्वारा 20 लाख करोड़ का पैकेज देकर कुछ राहत का कार्य किया है लेकिन देखना यह है कि क्या इससे अर्थव्यवस्था में सुधार होगा। हालांकि इस संदर्भ में अभी कुछ कहा नहीं जा सकता है। भारत की बढ़ती अर्थव्यवस्था अचानक इस तरह से रूक जाना निश्चित ही चिंता का विषय बना हुआ है।

धार्मिक उन्माद :– कोरोना संक्रमण ने धार्मिक उन्माद को भी बढ़ावा दिया है इसका उदाहरण दिल्ली के मस्जिदों से निकले मरकज़ के लोग हैं जो पूरे भारत में घूम–घूमकर कोरोना फैला रहे हैं। मौलाना साद आज तक पकड़ा नहीं गया है, चूंकि पूरे भारत में लाकडाउन चल रहा है ऐसे में सारी धार्मिक संस्थाएं– यथा मंदिर, मस्जिद, गुरूद्वारे, चर्च सभी बंद चल रहे हैं ऐसे में किसी एक धर्म का प्रचार–प्रसार कहाँ तक सही है। दूसरा उदा. पालघर में हुई दो साधुओं की निर्मम हत्या से लिया जा सकता है।

दैनिक जीवन में बदलाव :– कोविड–19 ने जहाँ एक तरफ सामाजिक, आर्थिक एवं राजनीतिक जीवन पर प्रभाव डाला है। वहीं दूसरी तरफ यह हमारे दैनिक जीवन पर ज्यादा प्रभाव डाला है। और यह प्रभाव सकारात्मक और नकारात्मक दोनों पहलुओं से समझा जा सकता है। सकारात्मक रूप में कोविड–19 ने सभी को यह सिखाया कि हमें दैनिक जीवन में क्या करना चाहिए और क्या नहीं करना चाहिए। कोविड–19 ने यह सिखाया कि हमें निरंतर अपने हाथों को साबुन से धोना चाहिए, मुख पर मास्क पहनना चाहिए, एक दूसरे से दूरी बनाए रखनी चाहिए, बिना वजह यहाँ–वहाँ नहीं घूमना–फिरना चाहिए। यही नहीं खाँसते और छींकते समय मुंह पर कपड़ा या रूमाल रखना चाहिए। इन सबका यह मतलब हुआ कि कोविड–19 ने हमारी बुरी आदतों को बदला है और जीने का नया तरीका सिखाया है।

दूसरी तरफ नकारात्मक रूप में यह संक्रमण हमें समाज, राज्य और परिवार से बिरक्त करता है। आज इनती बड़ी समस्या आ खड़ी हुई कि हम अपनों के अंतिम संस्कार में भाामिल नहीं हो पा रहे है। सभी सरकारों के लिए व्यक्तियों की संख्या निर्धारित की गई है। भादी–ब्याह में 50 लोग, व्यक्ति की मृत्यु होने पर 20 लोग ही भामिल हो सकते है। सोचनीय बात है। कोविड–19 ने सामाजिक ताना–बाना पूरी तरह से ध्वस्त कर दिया है। समय रहते हमें इससे निपटना पड़ेगा अन्यथा मनुश्य का अस्तित्व धीरे–धीरे समाप्त हो जाएगा।

निष्कर्ष :– आज कोविड–19 संक्रमण ने पूरी दुनिया को संकट में डाल दिया है। विश्व स्वास्थ्य संगठन ने भी इस संक्रमण को महामारी घोशित किया है। यह महामारी विश्व की सामाजिक, आर्थिक, राजनीतिक, धार्मिक और मानसिक स्थिति को प्रभावित किया है। सवाल यह उठता है कि इस स्थिति में क्या करें? तो उसका उत्तर स्पष्ट है कि हमें अपने आपको मानसिक रूप से मजबूत होना पड़ेगा। इस संक्रमण के साथ जीने की आदत डालनी पड़ेगी। सरकार के द्वारा बताए गए निर्देशों का पालन करना पड़ेगा। साफ–सफाई पर ध्यान रखना

होगा तथा दो गज की दूरी का पालन करना होगा। तभी इस संक्रमण से बचा जा सकता है। जहाँ तक सामाजिक ताने–बाने की बात है वह व्यक्ति से बनता है यदि व्यक्ति ही नहीं होगा तो इस सामाजिक व्यवस्था का कोई औचित्य नहीं होगा। सामाजिक व्यवस्था के सूचारू रूप से संचालन के लिए व्यक्ति की मानसिक स्थिति का ठीक होना आवश्यक है। निश्चित तौर पर कोविड–19 से सामाजिक परिवर्तन हुआ है इसको अनदेखा नहीं किया जा सकता है। लेकिन यह परिवर्तन भय, द्वेष, घृणा, अमानवीयता, असामाजिकता, गरीबी, बेरोजगारी, भुखमरी, पलायन, उन्माद जैसी परिस्थितियाँ भी पैदा किया है। अभी तक वैश्विक बाजार में इसकी रोकथाम के लिए न तो कोई दवा आई है और न कोई टीका बना हुआ है। आगे भविष्य में क्या होगा यह कोई नहीं बता सकता है। लेकिन हमें सावधान एवं जागरूक रहने की आवश्यकता है तभी हम और हमारा जीवन सुरक्षित रह पाएगा।

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Application of Remote Sensing and GIS Technique in Ground Water Exploration : An Approach

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Abstract :- This article describes the aspect of geo-environment and portable ground water zone of a watershed of the study area using Remote Sensing (RS) and Geographical Information System (GIS). Initially, based on satellite imagery, topographical, geomorphologic and hydro geological features are demarcated as a promising zone for ground water exploration in the study area. The socio-economic development of any country is based on land resources and water resources. Due to increasing the rate of population, these resources are over stretched often leading to resource depletion. Therefore there is need to prudently manage these delicate resources. RS & GIS techniques can be applied effectively to generate data and information for sustainable development. After more than twenty five years of satellite based land remote sensing experimentation and development, these technologies reached almost all sectors of earth sciences application. The use of remote sensing data and derivative information has ever promise of entering into mainstream of governing at local and regional level. This article enumerates the overview of mapping and management of natural resource using RS & GIS Techniques.

Keywords :- Remote Sensing, GIS, Ground water exploration, Geo-environment.

Introduction :- Ground water is the last component of the hydrologic cycle to realize the benefits of remote sensing. Ways in which remote sensing can be more effectively used for future ground water studies are suggested. The rapidly expanding human population, large scale changes in landuse / land cover and burgeoning development project and improper use of watersheds has all caused a substantial decline of natural resources of the country. Absence of reliable and updated information and data on natural resources, their conservation values and socioeconomic importance has greatly hampered development of policy, legislation and administrative intervention by the state. Increasing population, modern industrial and agricultural activities are not only creating more demand for ground water resource due to the inadequate availability of surface water resources, but are

also polluting ground water resources by releasing untreated wastes. Consequently, these activities have resulted in an increase of research, not only with regard to ground water resources but also with an emphasis on locating ground water of good quality for human consumption. The present paper focused on the study of the soil, vegetation, lineament, geomorphology and geology of the study area. Major problem with the region is identified as rapid growth of population and unplanned growth of the city horizontally in all direction. Many of the developments have come up in the recent years, which have affected the various regions in a drastic way. So there is a need for proper planning and careful handling of this alarming situation. Remote sensing for natural resource exploration activities for large areas requires airborne surveys using drone to facilitate detailed information for subsurface features and low cost imagery is an important advantage for environment and natural resource management, particularly in developing countries such as India (Singh 2015). The study focused on development of RS and GIS based analysis and methodology in the region for ground water recharge and exploration. Now days GIS is widely used for spatial modeling of hydro geological prospect of a large area with more reliability.

Objective :- This article seeks to demonstrate the usefulness of GIS technology in conjunction with Remote Sensing for exploration of ground water, its mapping and management for enhancing management decision making capabilities.

The main objectives of the paper are as follows :

- Investigate and apply various strategies for classification of these data in extracting earth resources information such as geology, land use and land cover, soil, geomorphology, vegetation and lineament for ground water exploration and identification of ground water potential zones.
- Evaluate the utility of multispectral data from one season over those from another
- Become aware of emerging innovative approaches to the analysis of satellite remote sensing and ancillary earth resources data
- Develop an organized, logical approach to computer-assisted processing of earth resource data for effective natural resource management and provide an insight to the researchers in analysis in technical way.

Data and Materials :- Satellite Data: Satellite Imagery like, IRS, Cartosat, AVIRIS etc.

(Microwave, Optical and Hyperspectral)

Collateral Data :- Topographic map, Geology Map, Soil map, Rainfall map, Well inventory data, pre - mansoon and post- mansoon data etc.

A brief methodology for execution of the research work is explained as follows :

Methodology Input data :- The procured satellite data of the study area were used for Geology, Geomorphological, Soil, Vegetation and Land use Land cover mappng. Published soil maps, topographic maps, climatic data etc. are also were collected and used as collateral data.

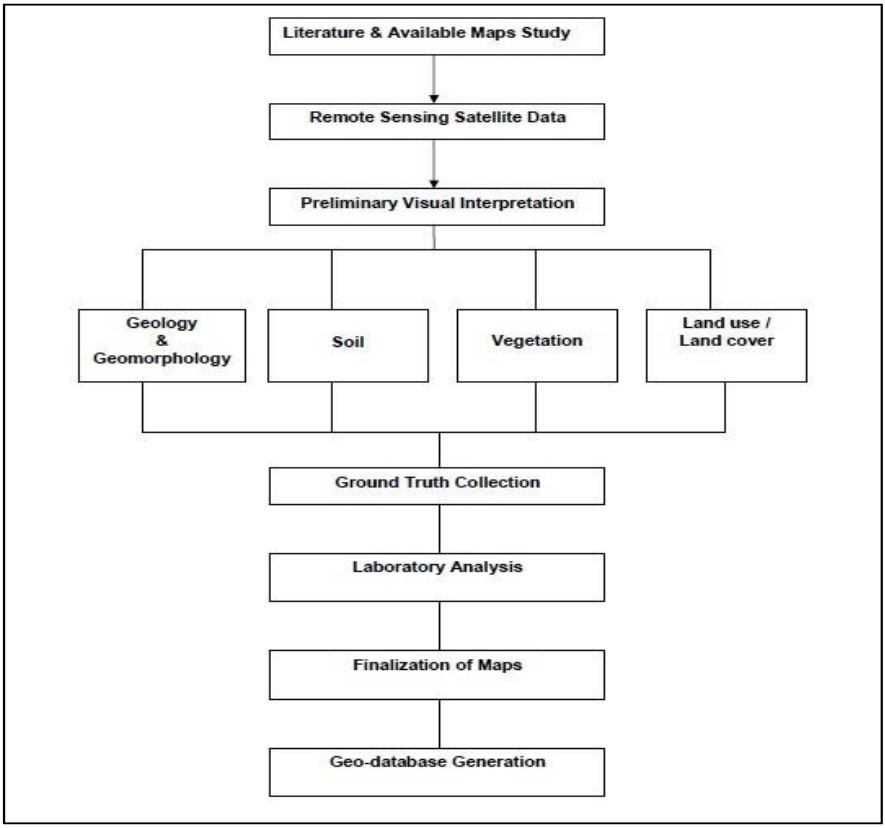
Data Processing :- The satellite data geo-referenced and suitable Image enhancements process are applied to facilitate the delineation and interpretation of different thematic information.

Data Interpretation :- Visual and digital interpretation methods were used to prepare pre-field interpreted map. The satellite data is interpreted based on photo elements like tone, texture, size, shape, pattern, aspect, association etc. These pre-field interpreted maps and digitally enhanced satellite data were used on the ground to identify different elements of various themes.

Field Verification and Data Collection :- Suitable field sampling designs in terms of line transects/quadrants were used to assess the interpreted elements and relate with satellite data. The field data collections were added by GPS in order to locate the ground verification points on the image and for further incorporation of details. For the all sample collection and field points visited attribute information on vegetation, geomorphologic, soil and topographic parameters were collected. The sample points were based on the geological / Geomorphological / soil heterogeneity, mapped from the satellite data.

Finalization of Maps :- Based on the pre-field interpretation, ground truth verification and available secondary information final maps were prepared in 1: 25000 scales. Towards this both visual and digital approaches can be conjunctively use.

The methodology flow chart is given below :



Methodology Flow Chart

Discussion

Land use\ Land Cover :- Today, land use and land cover (LULC) mapping has a great significance in scientific research, in planning and in natural resource management (Singh & Dubey 2012). LULC map were prepared using satellite data (fig. 1). The classification scheme is designed keeping in view of the management practices addressing each landuse/ landcover parcel, amenability of these parcels for identification/mapping in dataset. Under the Level-I classification, Built up, Cultivated areas, Woody vegetation, Grasslands, Wastelands, and Water bodies were classified.

In addition subclasses of Level-I LULC classes observed based on spectral satellite data, evaluated on the ground to characterize the information classes. The LULC classes were visually interpreted based on tone/texture, contextual and ground information. LULC mapping is very important to know the detail overview to the region it will help to identify the area covered by different classes/object on the earth.

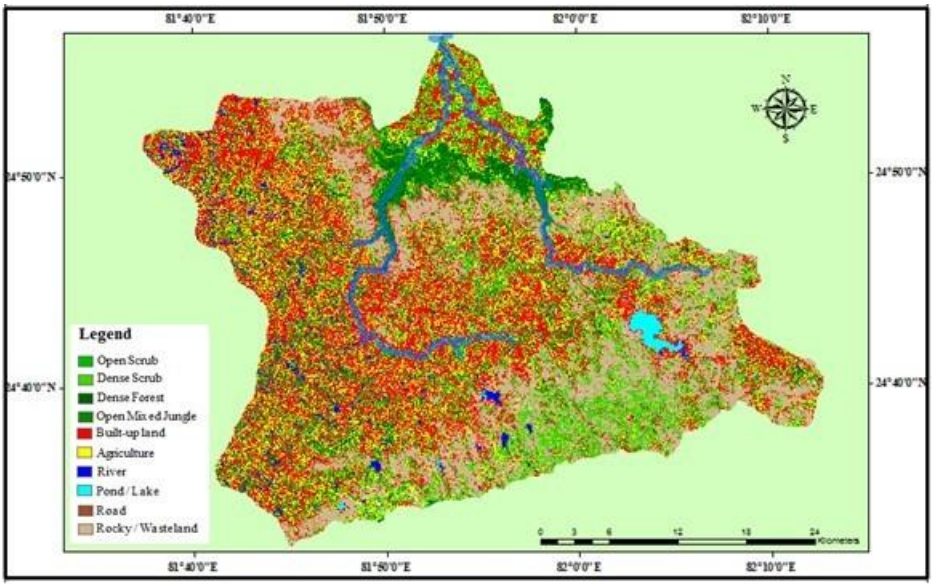


Fig. 1: LULC Map of Naina – Gorma Basin, Rewa District (Source: Singh & Dubey, 2012)

Vegetation :- The vegetation cover map was generated using satellite data (IRS Resourcesat, LISS III & IV). The vegetation in the study area is regulated by climate, seasonality, physiographic, geomorphologic and soil regimes. The vegetation is broadly demarcated into natural and managed vegetation. Phyto-sociological analysis carried out after collecting sufficient number of sample data from the natural vegetated areas. The vegetation map further stratified into dense and open canopy density classes. Further different categories of vegetation under each of the community were extracted and analyzed to understand the percentage of vegetation present in the vacant land (fig. 2). Such information on spatial distribution in qualitative and quantitative terms would be useful in further exploring and analyzing

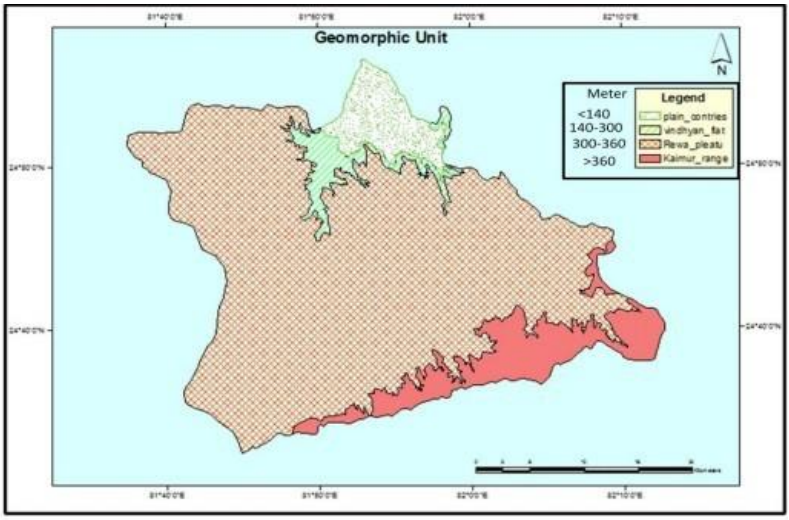
the aspects of biodiversity and ecological conservation. So the researcher can use these above details to generate the vegetation map using GIS and RS technique.

Fig. 2: Vegetation in the study region (Naina – Gorma Basin, Source: Singh V., 2016)

Soil :- The soil map was prepared using remote sensing satellite data (IRS- P6 LISS IV) and ground information. The soil can be classified in to following series level -

- Preliminary visual interpretation of satellite data
- Fieldwork to study important characteristics of soils and associated land characteristics such as landform, natural vegetation, slope etc.
- Laboratory analysis to support and supplement the field observations.
- Correlation and classification of soils into defined taxonomic units.
- Mapping of soils - that is establishing and drawing soil boundaries of different kinds of soils on standard geographical base map.
- Generation of Geo-database for Soil.

Soil map is helps to know the type of soil, its characteristics and texture of the soil present in the region. Coarse texture soil is very porous in nature and helps to infiltrate the water and recharge the ground water table.



Geology :- The geo-referenced satellite digital data were used to carry out 'on screen' vectorization of geological parameters.

1. Satellite data geo-referenced with the available map sheets.
2. LISS-III / LISS-IV and AWIFS data can be acquired for the entire study area
3. LISS-III was used for regional assessments and LISS-IV data can be use for detail assessments also.

These above said data sets were co-registered with other collateral data sets by taking common Ground Control points (GCP). The satellite data enhanced both in spectral and spatial domain. The geological structure was prepared with mainly on type of lineament with emphasis on length, Faults and thrusts. The geomorphological map (fig. 3) were prepared with emphasize on genetic classification of landforms. The ground observation must be incorporate at appropriate places to finalize post field map. Integrate to all the themes in GIS environment to generate hydro-geomorphology map.

Fig.3: Geomorphology of the Naina – Gorma Basin, Rewa District (Source: Singh V., 2015)

Lineament :- Lineaments are natural features in the terrain that have linear fractures like faults and joints which can be interpreted directly from satellite imagery. Satellite imageries plays major role in the interpretation and identification of the lineaments for the site suitability analysis for ground water exploration. By visually interpretation the lineaments of the study area were picked up and traced on the basis of tonal, textural, soil tonal, vegetation, topographic and drainage linearity, curvilinear ties and rectilinear ties (Drury 1990; Gupta 1991; Lillesand and Kiefer 1994). Lineaments are the hydro-geologically very important and they provide the path ways for ground water movement and enhanced well yields (Magesh et al. 2011; Subba Rao et al. 2001). Those regions having very high lineament density actually are the good sites for ground water accumulation because lineament density of an area can indirectly reveal the ground water potential, since the presence of lineaments usually denotes a permeable zone.

Conclusion :- All the thematic maps like soil, geology, vegetation, geomorphology and lineament plays very important role in the ground water exploration in the region. Lineaments help to the movement of ground water in the area. Coarse texture soil, vegetative region and area having alluvial and black soil with porous structure are more suitable for ground water recharge. So, the generated theme can be implementing for further planning of the urban and rural area. The action plan report can be create using the geo-data database and total decision support system, develop to depict location and type of action/control measures recommended for sustainable development plan of natural resources. Zonal and community wise soil resource development plan, Water resource development plan, vegetation resource development plan, LULC plan can be develop using the personal geo-database of the respective theme.

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Encapsulation of Health, Hygiene and COVID-19

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Abstract :- Outbreak of COVID-19 has compelled entire world to evolve new dimensions of living style. Everywhere conglomerate meetings and travelling is restricted. Common folk is bound to confine at home, accepted as an accolade of Lockdown. Always busy person has now started thinking of Individual Health in cascade with Community Health. Adapting to Hygienic approach act as catalytic booster. Health is the ability of a biological system to acquire, convert, allocate, distribute, and utilize energy sustainably. The WHO definition conceptualizes health as a human right requiring physical and social resources to achieve and maintain.

United Nations Children Fund (UNICEF) strategy for Health, stresses upon the importance of an integrated approach to early child health care and calls for improved facility for Water Sanitization Hygiene (WASH) services and practices. Health and Hygiene go hand in hand. Hygiene is the practice through which people maintain or promote good health. Making themselves and their surroundings clean, disinfecting surfaces, hands, units, surroundings and items of personal use in order to break the chain of infection, all contribute to hygiene. In general healthcare is to provide and promote quality care, focus on emerging diseases and invest in promoting and preventive healthcare. Waste management is also a necessary factor in Hygiene.

This review presents a synopsis on the current COVID-19 pandemic, with focus on preventive measures. Presently, no vaccines or specific treatment is available for COVID-19, in light of the aforementioned; prevention is the only substantial and less expensive option. With the envisaged explosive community transmission of COVID-19, it is recommended amongst many that social distancing which includes avoiding any form of contact with people and basic hygienic practices like thorough washing of hands with clean water and antiseptic soap for the duration of at least twenty – thirty seconds should be practiced always. An alcohol-based hand gel can also be used. Furthermore, health care workers should adhere strictly to the

standard preventive measures in areas of heightened COVID-19 pandemic. Use of face mask and sanitizer should be mandatorily accepted. Guidelines issued by WHO on Health & Hygiene must be strictly implemented to protect from killer SARS-Cov-2 (Severe Acute Respiratory Syndrome) disease.

Keywords :- Health, Hygiene, Virus, Pandemic, Vaccination, Infection, Outbreak, Transmission, Respiratory droplets, Contagious, Sanitizer, Social Distancing, Quarantine, Influenza, Coronavirus, Waste management, Mucosa.

Abbreviations :- WHO, WASH, COVID-19, SARS-COV-2, UNICEF, ECD, NHS, IFH, SARS, MERS, MATISS.

Introduction :- Recall well known phrase 'Health is Wealth'. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of creed, race, religion and Political belief, social, psychological and economical condition. Health is a resource to support an individual's responsibilities in society rather than an end in itself. A healthful lifestyle provides the means to lead a full life with meaning and purpose. Public health is trying to stop a disease that is unhealthy to the community. This is fixed by organized efforts and choices of society, public and private clubs, communities and individuals. It is about the health of many people, or everybody. Till date no medical cure and vaccine is available to neutralize impact of SARS-CoV-2 on living beings.

Analysis suggest that Hygiene is largely seen as synonymous with cleanliness. The terms 'Cleaning' and 'Hygiene' are often used interchangeably causing confusion about what Hygiene really means. Hygiene is the practices we adopt in our homes and everyday lives to protect ourselves and our community from infectious diseases. Good hygiene is crucial to good overall Health and wellness because it helps lower the risk for disease, illness and medical conditions caused by the impacts of poor hygiene. IFH (International Scientific Forum on Home Hygiene) is the international platform for developing hygienic practices. Targeted **Hygiene means** focusing our Hygiene practices in places at times when harmful microbes are most likely to be spreading in order to break the chain of infection.

Partial lockdown still prevails in most of the countries including India. It is well known now that coronavirus pave it's way to human body through mucosa tract. In such a scenario people are cautiously confined to stay at home and work from home to avoid coronavirus reception. Educational sector is also facing transforms. Traditional Offline classrooms have been replaced by online home classrooms. Homes are now converted in virtual self quarantine centers. Present review cum analysis provides a ready reckoner for Health and Hygiene tips to combat against COVID-19. Salient features of relevant WHO guidelines are reproduced for in hand knowledge about Health and Hygiene in tandem against SARS-CoV-2. Description is an attempt to encapsulate Health, Hygiene and COVID-19 into single envelope in order to make the concept easily understandable.

Health :- WHO defines health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'. This is consistent with the biopsychosocial model of health, which considers physiological, psychological and social factors in health and illness and interactions between these factors. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of creed, race, religion and political belief, social, psychological or economical condition. The health of all peoples is fundamental to achieve peace and security. The opinion and active co-operation on the part of the public are of the utmost importance in the improvement of the health of the people. The WHO definition conceptualizes health as a human right requiring physical and social resources to achieve and maintain. WHO further clarified, resource for everyday life is not the only objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. This means that Health is a resource to support an individual's responsibilities in society rather than an end in itself. A healthful lifestyle provides the means to lead a full life with meaning and purpose. 'Wellbeing' refers to a positive rather than neutral state, framing health as a positive aspiration. This definition describes health as 'a resource for everyday life, not the object of living'. From this perspective health is a means to living well highlighting the link between health and participation in society.

Good Health besides sturdy Immunity are the essential personnel ingredients to fight against COVID-19. Regular exercise, balanced nutritious diet and adequate rest, all contribute to good health. Physical well-being involves pursuing a

healthful lifestyle to decrease the risk of disease. Maintaining physical fitness, for example, can protect and develop the endurance of a person's breathing and heart function, muscular strength, flexibility and body composition. Good physical health can work in tandem with mental health to improve a person's overall quality of life. Governments have a responsibility for the health of their peoples which can be fulfilled only by the provision of adequate health and social measures.

UNICEF's Strategy for Health, stresses the importance of an integrated approach to early child health care, nutrition, education, Early Childhood Development (ECD), HIV, child protection, WASH services and calls for improved community-level health literacy and community-level support to WASH services and practices.

Hygiene :- Hygiene is a series of practices performed to preserve Health. According to WHO, "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases". Hygiene is a concept related to cleanliness, health and medicine. It is also related to personal and professional care practices. Good hygiene is crucial to good overall health and wellness because it helps lower the risk for disease, illness and medical conditions caused by the effects of poor hygiene. In medicine and everyday life settings, hygiene practices are employed as preventive measures to reduce the incidence and spreading of disease. Hygiene is the practice through which people maintain or promote good health. Making themselves and their surroundings clean, disinfecting surfaces, hands, units, surroundings and items of personal use in order to break the chain of infection, all contribute to hygiene. Hygiene and health both go hand in hand. Other hygiene measures are for instance keeping a certain distance from ill people. It is the practices we adopt in our homes and everyday lives to protect ourselves and our community from infectious diseases. Targeted hygiene means not only identifying time and places which represents a health but it also means applying a suitable hygiene procedure to break the chain of infection. The objective of a hygienic cleaning procedure is to reduce contamination to a level which is not harmful to health.

CO-Relation Between Health And hygiene :- Health is the ability of a biological system to acquire, convert, allocate, distribute, and utilize energy sustainably. Hygiene is a set of practices performed to preserve health. Many people equate hygiene with 'cleanliness', but hygiene is a broader term. It includes such personal

habit choices as how frequently to bathe, wash hands, trim fingernails and change clothing. It also includes attention to keeping surfaces in the home and workplace, including bathroom facilities, clean and pathogen free. A person cannot be said to be healthy merely by a disease free condition. He/she should be physically as well as mentally healthy. This demands a hygienic condition. Health and Hygiene are two correlated terms. With the kind of health risks posed to human race today, both terms are inclusively supplementary combination.

Health, Hygiene and Covid-19 :- Infectious disease COVID-19 continues to exert a heavy burden on Health and prosperity. Past epidemiology recorded majority of deaths in the under- developed/developing world; infectious disease caused around 4% of deaths in developed countries and is a significant cause of morbidity. Social, demographic and other changes are indicating towards increased role of Hygiene in home and everyday life. Agencies worldwide recognize that, for threats such as new influenza strains, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and Ebola, Hygiene is a first line of defence during the early critical period prior to mass curative measures such as vaccination become available. We need to practice Hygiene during food handling, using the toilet, coughing, sneezing, nose blowing, caring for domestic animals, handling or where a family member is infectious and is shedding infectious microbes into the environment. Disposing of refuse and waste management techniques needs implementation. Public awareness regarding concept of breaking the chain of infection by targeting the links in the chain is key to make informed decisions and practice effective targeted Hygiene rather than merely observing Health and Hygiene as a set of rules.

There is much to learn about SARS-CoV-2 that causes COVID-19. Based on what is currently known about COVID-19, spread from person-to-person of this virus happens most frequently among close contacts (within 6 feet). There are two main routes of transmission of COVID-19; respiratory and contact. Any person who is in close contact with someone who has respiratory symptoms (e.g., sneezing, coughing, etc.) is at risk of being exposed to potentially infective respiratory droplets. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19. Current evidence suggests that SARS-CoV-2 may remain viable for hours to days on surfaces made from a variety of materials. Cleaning of visibly dirty surfaces followed by disinfection is a best practice measure

for prevention of COVID-19 and other viral respiratory illnesses in households and community settings.

Essential facts about Covid-19 for Hygiene programming :-

- Covid-19 is a new disease and evidence is evolving. The virus is thought to spread mainly from person to person through respiratory droplets and contact with these droplets on surfaces.
- Respiratory droplets are generated when an infected person coughs or sneezes.
- Droplets may also land on surfaces where the virus could remain viable and thus the immediate environment of an infected individual can serve as a source of transmission (contact transmission).
- The rapid spread of the disease and the ensuing temporary overload of the National Health System (NHS) demands for effective measures to slow the spread of the disease.
- Many countries are responding to the spread of Covid-19 by limiting or recommending limiting mobility across and within communities. Planning for limiting human-to-human contact will need to be an essential part of the response to the Covid-19 outbreak.

Safely managed WASH services are an essential part of preventing and protecting human health during infectious disease outbreaks, including the current COVID-19 pandemic. Good and consistently applied WASH and waste management practices, in communities, homes, schools, marketplaces and health care facilities will further help to prevent human-to-human transmission of COVID-19. With an incubation period of between two-fourteen days, signs and symptoms of infection are mild to high respiratory illness; characterized with cough, breathing problems (shortness of breath), high temperature (Fever), tiredness (Fatigue) and nausea. Presently, no vaccines or specific treatment is available for COVID-19, in light of the aforementioned; prevention is the only substantial and less expensive option.

While efforts continue to contain the spread of the novel coronavirus on Earth, a space-based experiment called MATISS (Microbial Aerosol Tethering on Innovative Surfaces in the international Space Station) has been investigating how ‘smart surfaces’ on the International Space Station could stop pathogens in their

tracks. The experiment examines the performance of five advanced materials in preventing illness-causing microorganisms from settling and growing in microgravity.

Conclusion :- Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Health is a resource to support an individual's function in society, rather than an end in itself. In medicine and everyday life settings, Hygiene practices are employed as preventive measures to reduce the incidence and spreading of SARS-CoV-2 disease. There is much to learn about the novel coronavirus. This virus is likely to be with us for many months or years to come.

Development of effective Corona drug, medicine, vaccine and MATISS are in primitive stage. So adapting aforementioned Health and Hygiene practices are suggested as good long-term strategy for keeping our community Safe & Healthy against COVID-19 amidst presence of other deadly viruses in our vicinity.

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Uttrakhand : Role of Human Involvement in Climate Change

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Abstract :- Uttrakhand state came into existence on 9th Nov 2000. Sustaining a balance between Development and Environment was one of the biggest challenges before the policy makers. In the course of run avarice nature of mankind over-exploited the enriched natural resources thereby disturbing the precious ecosystem. Uttrakhand has typical Topography. Geographical area spread from high altitude Himalayan Tundra regions to vast plains of Terai. Out of 53483 sq Km of territory 71.03% is tropical forest land. Although state received more than 550mm of average rainfall in 2018 but community still faced acute drinking water deficit during summer and winter seasons. Adhering to unidirectional progressive approach and overlooking Environment has resulted in Climate Change (CC). Merely in past two decades temperature of Dehradun, Pithoragarh, Chamoli and Rudraprayag districts has witnessed 3-4 degree Celcius rise. Uneven rainfall in districts of Uttarkashi, Pithoragarh and Chamoli has hiked by 3%. Himalayan glaciers are drifting behind by 1.5 feet/year. Probability of frequent tremors in Himalaya and Delhi NCR is showing upward trend.

Role of human is certainly responsible for CC. Factorial causes of CC are studied. Uttrakhand's think tank has devised sectoral system to cope with CC caused by Human Involvement (HI). For redressal, Policy makers SAPCC is elaborated. International agencies, Switzerland's SDC and UNDP approved by GOI for facilitating guidance with financial linkage and monitoring the execution of SDP is mentioned. UNDP expects Uttrakhand will have Green roads, Green buildings and Carbon-Neutral environment by the end of year 2020.

Keywords :- Topography, Geographical region, Ecosystem, Tundra, Terai, Human Involvement, Climate Change, Aachman, Anthropogenic, Environment, Natural Disaster, Biodegradables, Green roads, Green buildings, Carbon-Neutral.

Abbreviations :- CC, ND, NCR, SIDCUL, BEE, ECBC, NOC, NGT, SAPCC, SDC, SDP, UNDP, GOI, NH, HI, EWS, GDP

Introduction :- Uttrakhand state came into existence in the year 2000 after the prolonged struggle of inhabitants. State has typical topography. Being a border state, it shares 374 Km of boundary with China. It holds status of special hilly state. Ranging from high altitude Himalayan Tundra region to vast plains of Terai spreads its topography. Out of 53483 sq Km of total geographical territory 71.03% is forest land. Temperature varies from +40 to -9 degree Celcius. Nature has blessed Uttrakhand with 17 fresh water rivers and nearly 31 lakes.

Sustaining a balance between Development and Ecosystem was one of the biggest challenge before policy makers. In the name of progress; in due course of run the avarice nature of mankind over exploited its enriched natural resources thereby disturbing precious ecosystem. Although state received 550 mm rainfall in 2018, which is more than National average rainfall but state still faced shortage of drinking and irrigation water supply in the scorching months of summer. Adhering to unidirectional progressive approach of Development and overlooking Environment, HI has thereby resulted in CC of Uttrakhand. Districts of Dehradun, Pithoragarh, Chamoli and Rudraprayag have witnessed 3-4 degree Celcius rise in temperature in merely past two decades. Uneven and unpredictable rainfall in districts of Uttarkashi, Pithoragarh and Champawat has hiked by 3%. Himalayan glaciers are drifting behind by 1.5 feet/year. Incidents of Wildfires are increasing day by day. Probability of frequent tremors in Himalayan region and Delhi NCR has risen. Balance between Development and Environment needs to be maintained for life to sustain in Uttrakhand.

As shown above, role of HI is certainly responsible for CC. Factors responsible for CC are studied. Think tank of Uttarakhand has devised a sectoral approach system for redressal of CC caused by HI. Govt of Uttrakhand has deployed International Agencies to provide guidance alongwith financial linkage and monitor the implementation of scheme. Deployed agencies have predicted that Uttrakhand will have Green roads, Green buildings and Carbon-Neutral Environment by the end of year 2020. Validation of prediction is yet to be seen.

Factors responsible for CC

1. **Urbanization** :- Construction of skyscrapers, lofty buildings, commercial complexes etc is increasing day by day without proper provisions of rain harvesting system, sewage & drainage and fire fighting systems has raised issues regarding falling

ground water table, water logging, water pollution and building fires. Bureau of Energy Efficiency (BEE), evolved ECBC Code-2007 to promote energy efficient buildings. UREDA (Uttrakhand Renewable Energy Development Authority) is the Nodal agency in Uttrakhand for issuing NOC for the construction of new buildings after taking into account the ECBC (Energy Conservation Building Code) provisions.

2. **Industrialisation** :- Under the banner of SIDCUL the state is successfull in inviting industries with introduction of lucrative package. Tax relaxations and cut in electricity tariff attracted entrepreneurs toward state. However, monitoring departments failed to control air pollution and discharge of industrial effluents in rivers. As a consequence first time in history it was reported in 2013 that Ganga water has ceased to be suitable for Aachman at Har Ki Pauri, Haridwar. NGT(National Green Tribunal) recently gave notice to Govt of Uttrakhand for immediate closure of eight industries in Sitarganj area for violating NGT Act 2010.

3. **Deforestation** :- Out of total geographical area Devbhumi has 71.03% as forest cover. Forests are natural shelter of wild habitats. Atmospheric Carbon dioxide is converted into Oxygen through photosynthesis. Forests are vital part of food chain and building material provider. Uttrakhand'a forests are endowed with medicinal plants. Recent trends have revealed that forest cover is depleting due to various Anthopogenic activities and ND. Uttarkashi district has lost 75 sq Km followed by Nainital district which lost 70 sq Km of forest cover. Deforestation has exacerbated Desertification.

4. **Road Connectivity** :- Uttrakhand has a feeble population of 1.17 Cr but inception of new state triggered formation of new local platforms viz: Nigams, Blocks, Nagar panchayat etc thereby arousing demand of road connectivity. At present Uttarakhand has about 3500 Km of NH network. Construction of roads in hilly terrains leave behind million & million tonnes of debris which is finally dumped into rivers. Frequent landslides is the common phenomenon at road construction sites.

5. **Modern Farming** :- HI has changed rainfall in state into uneven and unpredictable event. Farmers now rely much on pumping sets for irrigation and cattle needs thereby causing ground water table to fall further. Dependence on chemicals like; pesticides, insecticides and fertilizers for better yield of crops has increased soil salinity. Several acres of fertile agricultural land has turned into barren land in Khanpur and Bhagwanpur blocks.

6. **Energy** :- To cater the daily demand of 43 MU of electricity the state has 3400 MW of installed capacity. With the outcome of new Hydro Electric Power Projects the state now enjoys status of energy surplus. On the reverse front this anthropogenic event has given rise to deforestation, loss of flora & fauna and exodus of inhabitants. Addition of 750 MW of gas based plants in Kashipur town has further exacerbated ecological concerns.

7. **Tourism** :- Tourism is treated as industry in Uttrakhand. Its contribution in state economy is significant. However, unplanned travel tours, non inspection of vehicles and unavailability of human waste dumping yards has made tourism a menace for ecosystem. On overt side Tourism contributes in state's GDP while on covert side tourist influx leads to road congestions. Infrastructure needs huge concern.

8. **Non Biodegradables** :- Uttrakhandi's are no exception to adaptation of modern busy life style alongwith use and throw concept. State is worst in India to process solid-waste. Every day about 1500 tonne of solid-waste is generated, while processing is 0%. None of the city in Uttrakhand could find place in Swach Sarvekshan conducted by GOI. More and more use of polythene, plastics and other Non Biodegradables has disturbed ecological balance; Non Biodegradables persist in Environment for centuries to come before decomposing thus contributing towards CC in Uttrakhand. On solid-waste management side: Two solid-waste treatment plants in Dehradun and Haridwar are in pipeline. State also has small solid-waste segregators in Kicha, Nainital and Joshimath where Biodegradables are segregated and converted into organic manure.

State Action Plan of CC :- GOI has approved a package amounting to Rs 8800 Cr for SAPCC. Govt of Uttrakhand has designated Department of Forest as Nodal Agency for the implementation of SAPCC in two phases of three years each. Sectoral approach is adapted to work on four sectors initially which are :

1. Natural Disasters (ND)
2. Forest
3. Energy
4. Water

International agencies like Swiss, State Development Cooperation (SDC) and United Nations Development Program (UNDP) have been entrusted to facilitate guidance along with financial linkage and monitoring the execution of State

Development Program (SDP) for CC respectively. Uttrakhand now has Green road link from Kotdwar to Corbett National Park joining Garhwal & Kumaon regions. Green road is relatively a new concept for road design which integrates transportation functionality and ecological sustainability. Scheme also emphasises on Green building constructions which is an outcome of sustainable design focusing on increasing the efficiency of resources used (manpower, time, materials, water and energy) while reducing building impacts on human health and Environment during building's life cycle. Hari Green Enclave Shopping Mall & Green View Residency in Dehradun, Green Avenue Apartments & Haridwar Green Apartments in Haridwar are few updates of Green buildings in Uttrakhand.

Conclusion :- Role of HI in Uttrakhand's CC is exacerbating towards unpredictable & uneven rainfall, rising temperature, landslides, avalanches, depleting glaciers, floods etc, needs to be addressed. Early Warning System (EWS) is to be devised. Validation of International Agencies, Swiss SDC and UNDP prediction that state of Uttrakhand will have Green roads, Green buildings and Carbon-Neutral Environment by the end of year 2020 is yet to be seen.

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An evidence-based review of yoga on physical, psychological health and quality of life

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Abstract :- This manuscript brings forth information regarding the therapeutic effects of asanas, pranayama and meditation as it has been studied in various populations concerning a multitude of different disorders. The objective of this study is to assess the selected current evidences of the therapeutic effect of yoga and to provide a comprehensive review of the benefits of regular yoga. Collectively these reviews suggest a wide spectrum beneficial effect of yoga but a wider and in-depth study is required for virtually all of them to firmly establish such benefits. Though yoga has full potency to establish itself as a supportive adjunct to mitigate several psychosomatic and psychophysiological disorders and improvement in quality of life.

Keywords :- asanas, asanas, psychosomatic, parasympathetic.

World health organisation (WHO) has considered alternative medicine as the second line of health care (WHO, 2013) practice that are adapted by a majority of global population. Yoga is one of the most ancient practice mentioned in ancient Indian manuscripts and practiced by saints. Yoga involves many physical postures called asanas, breathing exercises pranayama, meditation, specified feeding habits and a specific life style. These practices give several psycho-somatic and physiological benefits like body flexibility, strength and better coordination between body and soul, all these enhances the quality of life.

But systematic reviews on the therapeutic effects of yoga is still inconclusive and not supported by well documented scientific research. In this review paper we have summarised the current findings on the therapeutic effects of yoga on psychological and physiological parameters of humans.

Yoga in pulmonary function :- In literature review twelve studies were examined evaluating effects of yoga on pulmonary function in healthy individuals and patients with chronic bronchitis and asthma (Raub,2002). In both patients and healthy

individuals practicing yoga, there are reported improvements in various parameters of lung functions like respiratory rate, peak expiratory flow rate (PEFR), forced vital capacity (FVC) with breathing control technique (pranayama), specific postures (asanas) and relaxation techniques. Saxena and Saxena also evaluated the effects of breathing exercises in patients with asthma for three months. Forced expiratory volume and peak expiratory flow rate were measured in volunteers during the three months duration. A significant improvement in the symptoms and lung function was observed in the intervention group compared to control group. Similarly, Sodhi et al conducted clinical trial with patients suffering bronchial asthma and described improvements in peak expiratory flow rate and diminished frequency of asthma attack. Compared to control groups.

Yoga on human physiology

Cardiovascular endurance :- Literature review that included five controlled studies reported significant improvements in cardiovascular parameters of the patients who practiced pranayama and asanas both. The parameters measured included oxygen consumption, work output and blood lactate during exercise. also, improvement in physical fitness and cardiopulmonary endurance was found in young adults and patients. Maurya et al and Goyal et al, 2014, both carried out studies to evaluate the effect of yogic breathing exercises on hypertension and autonomic functions and found small but significant reduction of SBP and /or DBP. However, several notable biases for example lifestyle and other factors, in the studies reviewed and limitations in several of studies which makes it difficult to detect an effect specific to yoga.

Glucose regulation :- Aljasir et al, 1987 examined the management of type 2 diabetes and suggested favourable effects of pranayama and asanas on parameters of diabetes. In other reports also induction of yoga in lifestyle reported a large and significant reduction in fasting glucose level. The author's discussed differences in the study groups and interventions as possible explanation for variability in results.

Yoga and generalized anxiety disorders :- Generalized anxiety disorder (GAD) is a chronic psychiatric disorder with high rates of co-morbidity all over the world. The central feature of GAD is stress, depression, anxiety and fatigue. We have found several relevant publications and six reviews on effect of pranayama and meditation and GAD.

MK Khalsa et al (2015) concluded improvement in anxiety, depression, panic, sleep and quality of life (QOL) in a total of 32 participants and suggested yoga as a promising treatment for those suffering from GAD. Kirkwood et al (2005)

identified eight controlled trials all with positive results. Other uncontrolled trials de Vicente (1987), concluded improvement in anxiety for population with primarily anxiety disorders.

Discussion :- These systematic reviews suggest a number of areas where yoga may have beneficial health effects but more research is required for virtually all of them to definitively establish benefits. We find a significant effect on the pulmonary function, physiology and psychosomatic disorders. Yoga establishes spiritual state of unity and is practiced to produce physical and emotional wellbeing. Scientific research suggests that yogic exercises improves anxiety (Khalsa and Cope, 2006; Richardson and Pilkington, 2005), hypertension (Field, 2011). Yoga may produce its wide spectrum implications by invoking an endogenous, coordinated response in which arousal of the autonomic nervous system and activation of the hypothalamic pituitary occurs (Jacobs,2009). The improved quality of life can also be explained by an calming and focusing the mind to develop greater awareness, high self-competence, lower anxiety, reduced distress etc.

Yogic asanas specifically improve body flexibility and fitness with a synergistic effect on the psychosomatic disorders, while the meditation and pranayama may result in cardiovascular parameters. Recent RCT have suggested pranayama exercises shift the autonomic nervous system balance from sympathetic to parasympathetic by enhancing parasympathetic output, probably by vagus stimulation, producing positive changes in cardiovagal function and associated neuroendocrine control. This shift towards parasympathetic may be responsible for the observed cardiovascular effects like lower systolic and diastolic blood pressure, heart rate in hypertension patients.

Conclusion :- Yoga (pranayama and asanas) with meditation are simple, cost effective long-term therapeutic benefits for people with diagnosed disorders or just on the border line of developing a disease. the available evidence indicates yoga may help to improve patient's self-efficacy, self-competence, physical and psychological fitness and may be effective as a supportive adjunct to mitigate medical condition. Although the data supports the potential of this therapy but not yet enough to use as a proven standalone curative treatment. Confirmatory studies with higher methodological quality, heterogeneity of sample and adequate control intervention is needed.

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Potentiality of Spatial Technology in Ecosystem Management

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Abstract :- Spatial technology includes Geographical Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS) and is extremely important for ecosystem management issues at local, regional, National and international level. Ecosystem management is a complex issue as all the variables of biotic and abiotic components are inter-linked and related directly or indirectly with each other. Spatial technology analysis involving various parameters of air pollution, public health, conservation of natural resources, air quality parameters and toxic chemicals like heavy metals, polycyclic hydrocarbon (PAH), volatile organic compounds (VOC), ozone, carbon dioxide particulate matter (PM2.5 and PM10) etc can be monitored and provide effective planning, decision making and management of ecosystem. Remote sensing or satellite data due to synoptic coverage, repetitive data gathering capabilities, spatial information, economically cheaper & sustainable technology, real time data collection & computer compatibility, coupled with GIS are extremely useful in monitoring, assessment, evaluation & management of total environment. Remote sensing data or satellite data are extremely useful for monitoring, assessment & evaluation, planning and feedback mechanism and management of all components of ecosystems.

Keywords :- Ecosystem management, Remote sensing, Digital number, Pigmentation, GIS, Spatial analysis.

Introduction :- Satellites provide both spatial and temporal information needed to understand changes in resources for their distribution, qualitative & quantitative assessment (e.g. water quality parameters necessary for developing better management practices to improve water quality) & thus for environment management. Life is not possible on earth without services of ecosystems, as it provide all basic needs and requirements from medicines to habitat and food. Balanced ecosystems are more stable, viable and rich in biodiversity. Ecosystem functions are affected broadly due to all human activities. Remote Sensing Applications coupled with Geographic Information System (GIS) is extremely useful in

the decision and solution [1] for environments management. Spatial technology (Remote Sensing & GIS) is a potential area for management of all components of environments like soil, water, fauna & flora and other compositions. The application areas for remotely sensed data are both wide and varied [2]. Radiometric data potentially represent a very useful source of information in pedological research [3].

Remote sensing techniques because of synoptic coverage, repetitive data gathering capability, spatial information, real time data collection and computer compatibility are extremely useful in biodiversity assessment, environments management and sustainable development studies. Ready and timely availability of satellite observations of existing land use pattern from various remote sensing satellites now provide a most cost-effective means of identification of different forms of land, status of water resources, quantification of soil moisture content and soil degradation to enable all nations to take appropriate measures for maintaining productive use [4] of environments. Multi-date satellite data could be used effectively to find out the changes in the aerial extent of environments. False Color Composites (FCC) derived from the green, red, and infrared bands of satellite data can be virtually analyzed on 1:25000 or 1:50000 scale when information is required at the state/ national level.

An image interpretation key indicating the tone color, size, shape, texture pattern, location and association can be prepared for each category of vegetation including environments using ground truth information, topographical maps, aerial photographs, etc. The classification accuracy can be tested on a sample basis assuming binominal distribution for the probability of success/failure of sample tests. Sample size is decided using the Look Up Table (LUT), prepared by employing a binominal probability model. In Monitoring & role of effective communication for assessment, planning and management depends on the quality of satellite data. Remote sensing has important role for ecosystem management through groundwater conservation [5] and this is applicable urban as well as rural environment. Remote sensing has proved its potentiality in water resources management [6]. An environment may be related topologically with wastelands or forest ecosystems [7]; and may be affected by industrial pollution and consequently this may interfere indirectly with community people [8] living in nearby surrounding area and their economic status [9]. These aspects are advocating for ecosystem management and related issues through sustainable water resources management

[5]. The pollution of environment may affect whole ecosystem including the most important known medicinal plants [10].

Remote Sensing coupled with Geographical Information System (GIS) can be extremely useful [11] for environment management. The main advantage of satellite imagery is that the raw data are digital and can be analyzed using computer. The wavelengths that are widely used are visible & near infrared radiation in the waveband 0.4-3 um, infrared radiation in the waveband 3-14 um and microwave radiation in waveband 5-500 mm. Soil, basic requirement for maintenance of biodiversity, is supposed to have increased reflectance between 0.4 to 1.1 micrometer wavelengths [12]. GIS is computer-based powerful system [13] that provides the following four sets of capabilities to handle georeferenced data: (a) input; (b) data management (data storage and retrieval); (c) manipulation and analysis; and (d) output. GIS is able to query or analyze the attributes separately and to generate a map based on non-graphic values. Because of the arid climate, complex geological conditions, and human activities, environmental problems like lake of water resources, desertification, salinization, and biogeochemical endemic diseases etc. occur in fragile regions of the environment [14].

There is an urgent necessity of systematic inventory, mapping and monitoring of land resources [15-16] leading to an ecological balance in many areas. Ground survey is done to match digital data [17]. The spatial distribution and soil nature of these lands can serve as the base for the implementation of various reclamation measures and afforestation programmes [18]. Proper monitoring and planning through spatial technology leads to management of natural resources and ecosystem for sustainable development [19]. Spectral signatures of water, agricultural land, forest, wasteland etc. differ from each other distinctly [20]. Environmental protection and ecological balance are essential to ensure that development is sustainable in the long run [21]. The physiography, hydrology and chemical characteristics of soils are greatly responsible for the various kinds of land-degradation hazards [22]. Any major disaster affects a wide range of sectors of a society which can include political, social, cultural, environmental, physical, technological and economic aspects [23]. The characteristics of the pictures reflected on the remote sensing images are formed mainly by the difference in information of the tone and the form characteristics and spectral behaviour of each unit varies according to the nature and percent cover [24-25].

Methods of Investigation :- Primary and secondary data collection was done to use in this study. Methodology in ecosystem management using remote sensing & GIS is more or less same but many time variable and parameters are different and data set may vary from one place/ habitat to other and for different ecosystems. Methodology followed (an example of forest ecosystem in Sirsiya Block, Bharaich District, India was considered) include: (i) Preparation of base-map from Survey of India topographical sheet. (ii) Visual interpretation of Satellite data/ Imagery to study the various aspects of environment like biogeological aspects, vegetation, geology, urban-sprawl, hydromorphogeology, structural features and land use of the area. (iii) Digital enhancement of Remote sensing data for delineating vegetation, geomorphic and structural elements. (iv) Correlation of digital enhanced Remote sensing data with other data. (v) Preparation of vegetation anomaly map, hydromorphogeological & land-use maps from satellite imagery for study of vegetation aspects, land degradation aspects, groundwater potentiality and change in recharge capacity by changed land-use patterns. (vi) Imposition of interpreted Remote Sensing data on base-map. (vii) Soil samples' analysis to estimate fertility aspects. (viii) Field traverses for sample collection of soil, water & chlorophyll data using guide map. (ix) Analysis and modeling in GIS. (x) Application of GIS based approach for planning & management of ecosystem and environments.

GIS is able to query or analyse the attributes separately and to generate a map based on non-graphic values. The ability of GIS system to perform various analysis with graphic and non-graphic data play significant role in management of environments & natural resources like forest, soil and water etc. GIS uses spatio-temporal (space-time) location as the key index variable for all other information. Just as a relational database containing text or numbers can relate many different tables using common key index variables, GIS can relate otherwise unrelated information by using location as the key index variable. The key is the location and/or extent in space-time. Any variable that can be located spatially, and increasingly also temporally, can be referenced using a GIS. Locations or extents in Earth space–time may be recorded as dates/times of occurrence, and x, y, and z coordinates representing, longitude, latitude, and elevation, respectively.

Analysis in GIS :- GIS can handle huge data sets (spatial & non-spatial data). All the data (spatial & non-spatial) are integrated in GIS and analysis & modeling in GIS using satellite and other data is done for monitoring, planning & management plans and finally for decision making & sustainable development and therefore in ecosystem,

biodiversity and environment management. In Analysis/ modeling, for example, equation used in GIS for different overlays is :

Output = select{i1=1,1,0}+ select{i2=2,2,0}+select{i3=3,3,0}+ select{i4=4,4,0}+---N.

where i is input and 1,2,3,4, --- N represents number of layers overlayed. Analysis and overlaying steps for open degraded forest area were done in following steps: Step-1: Open forest map Vs. Ground water potential map; Step-2:Step 1 Vs. Soil texture map; Step-3:Step 2 Vs. Soil fertility map; Step-4:Step 1,2 and 3 repetition for various combinations. These are some of the steps for GIS modeling and analysis for various aspects of ecosystem. Various data (spatial and non-spatial can be used for management of any aspect of ecosystem, depending and requirement of data and output.

Conclusion :- Monitoring of various variable and parameters of biotic and abiotic components of ecosystem and biodiversity is extremely important for planning and management of ecosystem to take decision for sustainable development. Best available technologies like remote sensing & GIS have high potential and viability for any Nation for its biodiversity management. Productivity in terms of natural resources and functioning of each component of natural resources is monitored precisely through satellite data. Each substance or object absorbs certain energy and therefore reflect different energy that is captured by satellite imageries, because the reflected energy depends on the physical, chemical & biological properties of an object. Information captured on satellite imagery is true picture of the objects or substances present on ground or earth surface. Cartosat-2, an Indian satellite has resolution of 1 m. RS provides information upon which decisions on different management options and mitigation measures for specific wetlands or sections or components of ecosystems are made. Multi-spectral satellite data having specific utilities for vegetation mapping, classification, quantification, spatial analysis, temporal change detection, detection of diseased & stressed vegetation etc in addition to pigmentation, physiological structure, and architectural organization and water contents are attributes, which are responsible for vegetation reflectance in multi-spectral data.

Remote Sensing and GIS identifies and articulates current and emerging information needs of those involved with the management of forest ecosystems. Spatial technology explores the potential of spatial technology for further

development for legislative and judicial policymakers who do not have a technical background in either remote sensing or resource management but who are nonetheless called upon to make decisions regarding the protection and management of forest ecosystems. Remote sensing/ Satellite images help environment scientists to observe (land cover, boundaries, threats, damage, topography etc.), monitor (change in forest cover, range condition, land use etc.), classify (into vegetation and land use categories, habitats etc.), measure (areas, distances, height/elevation etc.), detect (fires, resource use violations) etc. for natural resources management. Because reflected electromagnetic radiations are different for different substance or object therefore digital number (DN) value is different for different objects, this DN value is useful for object identification & image interpretation which is done through involvement of shape, size, tone, shadow, pattern, texture, size (location), association and resolution of satellite imagery/ data.

Spatial information/ data & distribution pattern of each Parameter/ component of Natural Resources (NRs) & ecosystem is obtained through interpretation of satellite/ Remote sensing data with limited ground truth/ checks (field based). GIS can handle huge data sets (spatial & non-spatial data). All the data (spatial & non-spatial) are integrated in GIS and analysis & modeling in GIS using satellite and other data is done for monitoring, planning & management plans and finally for decision making & sustainable development and therefore in biodiversity, ecosystem and environment management.

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