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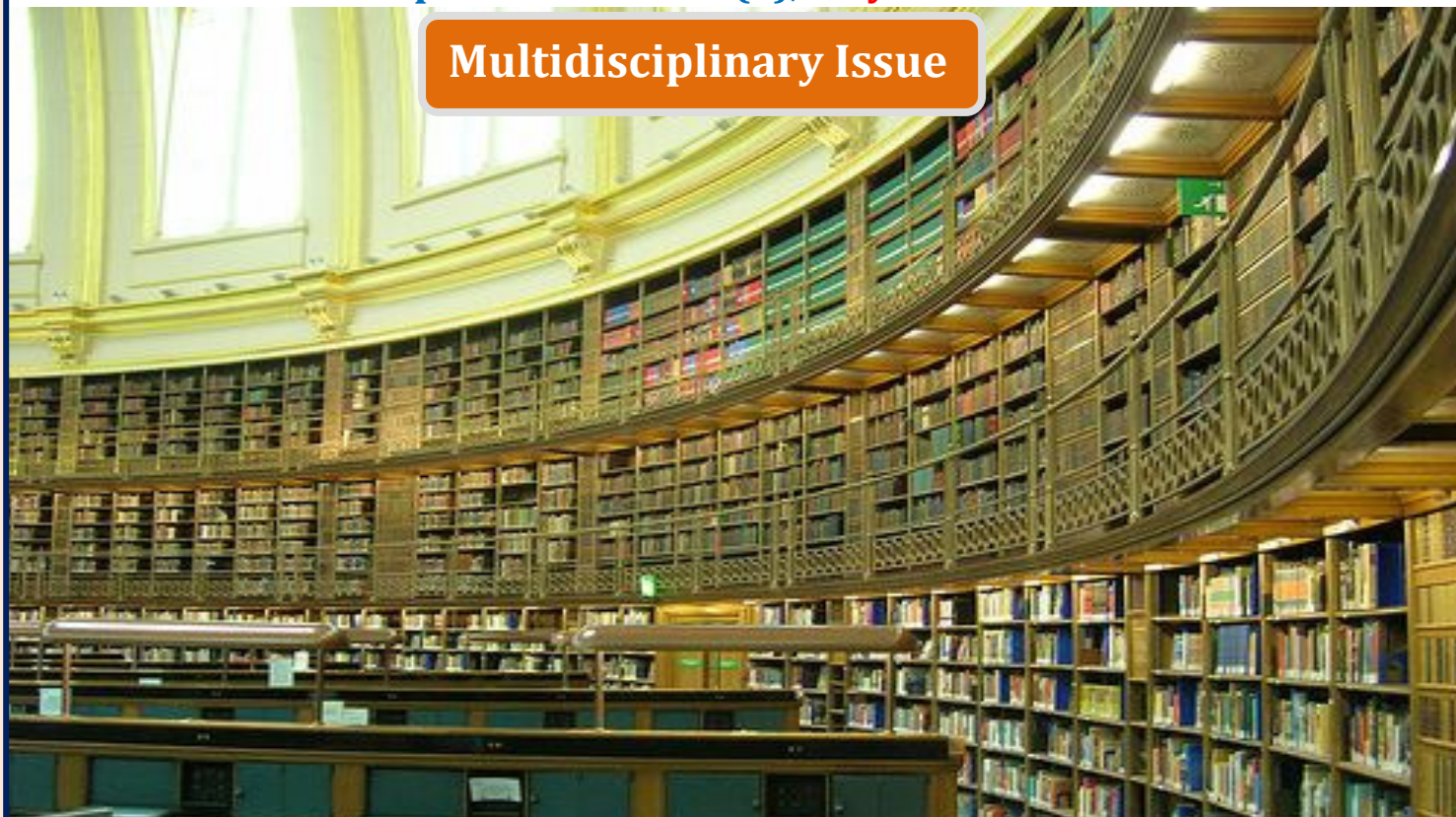
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INDEX

No.	Title of the Paper	Author's Name	Page No.
01	Study of the Problems and Challenges before Librarians in Lockdown	Dr. Rajendra Latpate	05
02	Voicing Feminism in Bama's <i>Sangati</i>	Dr. Divya Das	08
03	A New Trend of Electronic Commerce- Social Commerce	Smt. Sampada Lavekar	12
04	Covid-19 and Online Education Impact on Educational System	Dr. Sanjay Fulzele	17
05	Job Stress of Bus Drivers and Conductors of MSRTC under the Threat of Coronavirus	Mrs. Mrudul Kamble	21
06	Business Intelligence - Boost for E Commerce Business	Mr. Maruti Kumbhar	25
07	Digital Libraries : Opportunities and Challenges in the Current Scenario	Mr. Ashwin S. Amrutkar & Mr. Mohan Nikumbh	31
08	An Overview on Useful Tools in Research Methodology in Library and Information Science	Dr. Dnyaneshwar Maske	36
09	Role of IT in Inclusive Growth & Economic Development'	Dr. Gautam Dhale	41
10	Emotional Intelligence as an Effective Managerial Skill	Dr. Sabiha Asif Faras	47
11	Journal of Indian Library Association : A Content Analysis (2015-2020)	Dr. Rahul Lokhande	52
12	Koha : Open Source Software for Library Management	Dr. Santosh Salunkhe	60
13	Problems in Implementing S.G.S.Y in Sindhudurg District	Prof.B.H.Chaugule	64
14	Use of Technology in Library Security	Mr. Mohan Nikumbh & Mr. Ashwin Amrutkar	67
15	Data Analysis of COVID-19 and Its Predictive Features Worldwide	Vijay S. Raykar	71
16	E-Learning in Schools During Coronavirus (Covid-19) Pandemic on Tamilnadu : Challenges and Opportunites	Dr. Hameed Basha & Mr. H. Vignesh	77
17	Historical Significance of Early Pandya : A Study through Rock Cut Sculptures	Dr. S. Sridhar	82
18	Portrayal of Woman in the play, The Homecoming by Harold Pinter	Mr. Dinesh Betkar	86
19	Impact of Technology on Higher Education in India	Dr. Divya Das	91
20	COVID-19 Pandemic, Animals and Environment : A Global Review	Nandu Hedulkar	95
21	Neocolonialism in Nuruddin Farah's Sweet and Sour Milk	Mr. Santosh Rade	100
22	The 'Researchgate' Score of University of Mumbai : An Analysis	Dr. Rahul Deshmukh	106
23	भारतीय कृषि का वर्तमान परिदृश्य एवं प्रमुख चुनौतियों का विश्लेषण	मूलाराम	112
24	जनसंचार के रूप में भारतीय सिनेमा	प्रा. आनंदा कांबळे	118
25	जलवायु परिवर्तन का स्वास्थ्य पर प्रभाव - एक आकलन	अशोक कुमार	121
26	राष्ट्रकवि डॉ. वृजेश सिंह की गज़लों में जल-पर्यावरण चेतना	प्रा. रवीन्द्र ठाकरे, डॉ. अनीता नेरे	128
27	हिंदी साहित्य में स्त्री विमर्श	निलेश कारेकर	133
28	ई-अपशिष्ट का पर्यावरण पर प्रभाव : मुद्दे, चुनौतियाँ एवं समाधान	अशोक कुमार	136
29	हिंदी ग़ज़ल साहित्य का परिवर्तित स्वरूप	प्रा.रवीन्द्र ठाकरे, डॉ. अनीता नेरे	142
30	नवीन शिक्षा नीती : वास्तविकता आणि युवापिढी	अंजना बोखारे	147



31	विद्यापीठ व कॉलेजच्या परीक्षांवर कोविड-१९ चा झालेला परिणाम	डॉ. सुनिल लोखंडे	150
32	महिला सक्षमीकरण आणि आर्थिक विकास	डॉ. मुरलीधर गायकवाड	153
33	डॉ. बाबासाहेब आंबेडकरांची जलनीती आणि समकालीन पाणी समस्या	डॉ. चांदोजी गायकवाड	159
34	ग्लोबल वार्मिंग के न्यूनीकरण में गुरु जांभोजी के चिंतन की भूमिका : विवेचनात्मक अध्ययन	मूलाराम	163
35	ई-अध्ययनाची साधने	श्री. विनायक नाकतोडे	169
36	शालेय आराखडा (School Mapping)	डॉ. अविनाश भांडारकर	172
37	डिजिटल लायब्ररी सर्व्हिसेस	डॉ. प्रतिभा बराडे	175
38	QR Code या तंत्रज्ञानाचे ग्रंथालयांमध्ये उपयोजन	मयूर पडोळे	179
39	मराठी रंगभूमीच्या विकासात लोकरंगभूमीच्या कलात्मक अविष्काराचे योगदान	ज्योती काळे	183
40	'आत्मनिर्भर भारत अभियान' आणि डिजिटल परिवर्तन	डॉ. शर्वरी कुलकर्णी	186
41	सर जॉन मार्शल : जीवन आणि कार्य	श्री सुरेश पाटील	189
42	कोरोना काळातील शिक्षण प्रणाली	श्रीमती एस. एस. पाटील	194
43	उच्च शिक्षणामध्ये ग्रंथालयीन सेवेत माहिती आणि कॅम्प्युनिकेशन तंत्रज्ञानाचा प्रभाव	माधव घोडके	202
44	ग्रंथपालन व्यवसाय व भावीकाळातील संशोधन	प्रा. अनिल जेवळीकर	206
45	दौलतमंगल किल्ला	कु. निता टेंगले	210
46	पंचायतराज व्यवस्था आणि महिला सबलीकरण	प्रा. एस.एम. मुंडे, डॉ. डी. एस. कळंबे	214
47	भारतात ग्रंथालय आणि माहितीशास्त्र शिक्षण	मुग्धा राजनकर	217
48	लोककथांचा 'लोकतत्वीय' अभ्यास	डॉ. चांदोजी गायकवाड	221
49	स्थानिक इतिहासलेखन	कु. निता टेंगले	226

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COVID-19 Pandemic, Animals and Environment : A Global Review

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Abstract:

COVID-19 has emerged as a new threat nowadays to human life as well as the animals around us. It is estimated that there have been over 122 million cases of human infection with COVID-19 globally, with over 2.7 million deaths and widespread community transmission in many countries. Animals other than human beings have also been affected due to this pandemic. After the outbreak of COVID-19, environmental conditions including air quality and water quality in some places are improving and so wildlife is blooming. As many of the countries are observing lockdown for many months, it has given nature a "healing time" with reduced human interference in the natural environment. This article aims to highlight issues of animals and environment related to COVID-19 pandemic.

Keywords: COVID-19, animals, environment

Introduction:

The COVID-19 pandemic strongly highlights our existence in a global community. From a single city, it spread to 188 countries across the world and caused the deaths of over 3 million people by April 18, 2021 (https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210420_weekly_epi_update_36.pdf). Diseases carried by wild animals are quite rare. Humans are becoming increasingly exposed to wild animals and the disease they carry as the global wildlife trade continues to grow and human activities in tropical forests expand. Animals are forced to enter other or smaller regions when activities like mining destroy natural habitats, and they are more vulnerable to stress or ill which we, human beings, generally neglect. They're also more likely to come into contact with humans and domestic animals, allowing illnesses to pass from wildlife to humans. We already know that wildlife species are becoming vulnerable by exploitation or habitat loss are more likely to be disease vectors, and a recent study predicts that as nature continues to be destroyed, outbreaks of animal-borne diseases will become more common on the planet (<https://www.conservation.org/stories/impact-of-covid-19-on-nature>). The pandemic has cautioned livestock production, the possible risks linked with biosecurity, and adverse environmental consequences which could indirectly influence human health (Marchant-Forde JN and Boyle LA, 2020). The lockdown followed by many countries in the world has given relief to the earth planet and the environment has recovered to a certain extent in all aspects due to lowered anthropogenic activities (Bar, 2020). The present article discusses the interpretations of the COVID 19 pandemic on animals including human beings, and the environment.

Methods:

An analysis of literature related to the COVID-19 pandemic was done. Most of the literature was obtained from authentic websites, newspaper articles, research articles in journals etc.



Covid-19 and animals research:

Animal research is vital in the development and production of various vaccines and the investigation of drugs. Animals have sacrificed their lives for the welfare of human beings. Some examples of animal scarification for the well-being of the human race can be cited here. The 12,000-year existence of smallpox was finished after the discovery of the vaccine which eventually led to its eradication in 1980; Likewise, nearly forty years of research using monkeys, rats, and mice led to the pioneering search of the polio vaccine in the 1950s that eradicated the disease from most the continents. Now the efforts are towards fighting the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes COVID 19. Therefore many scientists have already begun their work in finding out vaccines against SARS-CoV-2. The animal models used for vaccines and drugs to fight COVID 19 used are Mice, Monkey Sheep, Ferret, Hamster, Cat, Rat, Chicken, Guinea Pig, Pig, and Rabbit.

COVID-19 disease, its infection to animals and hygiene:

The causative coronavirus (SARS-CoV-2) is likely to have originated in bats, although the animal species responsible for transmission to humans remains unknown. However there have been reports of animals infected with the virus worldwide. Coronavirus infection in domestic animals is likely to receive more attention (Christian Gortázar and José de la Fuente, 2020). It is reported that cats can be infected with COVID-19 and can spread to other cats, but dogs are not sensitive to this infection (<https://www.nature.com/articles/d41586-020-00984-8>). The Harbin Veterinary Research Institute also reported that chickens, pigs, and ducks are unlikely to be infected with the virus.

Most of these animals became infected after contact with people with COVID-19. The first US case of an animal testing positive for COVID-19 was a tiger at a New York zoo. According to reports, a small number of pet cats and dogs have been infected with SARSCoV2 in several countries including the United States. One ferret was reported positive for SARS-CoV-2 in Slovenia. Several other animals in zoos and sanctuaries have tested positive for SARS-CoV-2. This included big cats like lions, tigers, pumas, cougars, snow leopards and non-human primates like gorillas after showing signs of illness. It is suspected that these animals became sick after being exposed to an animal caretaker having COVID-19 without wearing personal protective equipment and following COVID-19 precautions (<https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/animals.html>).

It has come to know that several exotic Trans-boundary Animal Diseases (TADs) are present at the borders of the EU, to the east and south. These include FMD, sheep and goat pox (SGP), Rift valley fever (RVF), lumpy skin disease (LSD), and Japanese encephalitis (JE), among others. These diseases can enter the EU by different routes, including the movement of infected human beings, transport of infected animals, or natural or human-mediated movement of infected vectors. Human movements are currently restricted due to the COVID-19 pandemic, but wildlife or vector-mediated entry remains possible. Entry of any of these diseases would demand significant resources from the veterinary services and farmers to control the outbreak (Christian Gortázar and José de la Fuente, 2020).

In the United States, many processing plants were closed after a major outbreak was discovered, which put pressure on the pig and poultry industries. At one point, the processing capacity of live pigs dropped by 45%, which means about 250,000 pigs are not slaughtered every day (Marchant-Forde JN and Boyle LA, 2020). This has resulted in longer transport distances to



plants in operation with crowding of animals on the farm. Producers were encouraged to slow growth rates, but some had to cull animals on the farm. The result of this is to handle the carcass disposal which has raised associated potential biosecurity risks and detrimental effects on the environment. The public health danger provided by carcass disposal has a less visible influence on human welfare. Disposal practice of open-air burning and unlined burial of carcasses provide the highest hazards of contaminating ground and surface water, soil, and air with pollutants and pathogens such as E. coli and Salmonella of all corpse disposal options. Vectors that feed on carcasses, such as birds, flies, and mosquitos, offer additional dangers to human health because they can transfer biological leachate components. Hydrogen sulfide and ammonia, as well as particulate matter and microorganisms, are found in the air surrounding pig and poultry farms. Such pollutants act as eye and respiratory irritants. Exposure to these pollutants also contributes to mental stress and elevated blood pressure (Marchant-Forde JN and Boyle LA, 2020).

COVID-19 disease and environment:

During the long lockdown period, major pollutants such as nitrogen and carbon oxides have been significantly reduced. In different densely populated countries in Europe, the NO₂ concentration has dropped by as much as 45% to 54%. Compared with the same period in previous years, the NO₂ concentration in the thermal power locations of India and Bangladesh has dropped by about 40% to 45%. By the end of this year, total carbon emissions had been reduced by 7%. Due to the restricted consumption of fossil fuels by industry, thermal power plants, and transportation, the level of NO₂ and carbon emissions in the atmosphere has dropped significantly. In the lower atmosphere, due to reduced traffic and construction activities, the intensity of particulate matter such as PM_{2.5} and PM₁₀ has been reduced by 43% and 31%, respectively, and the air quality in different parts of the world has improved. The reduction of suspended particulate matter (SPM) to 15.9% has led to an improvement in surface water quality. Even in crowded cities, noise pollution has dropped significantly below 60 db. Therefore, it can be concluded that through the global lockdown to control the COVID-19 pandemic, the atmospheric environment has recovered to a certain extent in all aspects. The whole changing situation led to changes in the behavior of wild animals. Many reported cases of such wild animals roaming on streets, near the building, gardens indicate the interference of human activities do affect lives of natural creatures (Christian Gortázar and José de la Fuente, 2020). Shipping has also declined worldwide and reduced impacts on marine ecosystems. A global decline in greenhouse gas emissions, as well as large reductions in other drivers of global warming, such as the vapor trails from high-flying aircraft also given relief to the planet at least during the COVID 19 pandemic (Richard et al 2020).

Efforts of humans against COVID-19 have had unfavorable consequences for other species and the environment. For example, we are making, using, and discarding more single-use containers and personal protective equipment (PPE) than ever before to prevent infection. Mask production, for example, has risen considerably. For example, the WHO estimated that 89 million medical masks, 76 million examination gloves, and 1.6 million goggles would be required each month for the Covid-19 response, and China's policy to make 200 million face masks demonstrates the likely impact of its waste on this beautiful planet. Masks, Gloves, PPE kits, and sanitizers that aren't used will end up polluting natural areas (<https://www.nsmedicaldevices.com/analysis/companies-manufacturing-face-masks/>). Due to the interruptions caused by COVID-19, some states and cities have temporarily suspended or



postponed enforcement of regulations prohibiting shops from providing plastic consumer bags, which have created a temporary but quite good effect on the environment (<https://www.rila.org/retail-compliance-center/covid19-bag-legislation>).

Conclusion:

The spread of coronavirus is endangering humans as well as other animals. We must understand the connections between human and animal behaviors. It is essential to preserve biodiversity, ecological integrity and forecast global zoonosis and environmental change (Rutz et al, 2020). Human beings can protect themselves because they are more evolved than other animals and have an understanding of other things. But other animals may be relatively at risk of such a pandemic. There are examples of viral infections in these animals. Animal husbandry is an adjunct to agriculture. Such suspected animals related to husbandry were slaughtered on the assumption that the virus was transmitted from certain animals. The killing of millions of these animals here has affected the business and economic system. Even the large-scale culling of farm animals and the disposal of carcasses has created danger to the environment and humans. In addition, many animals are being used for research to prevent viral infections. If we leave scientists to such animals, the common man will ignore them. So this contribution of animals should be noticed by human beings as well. The impact of Covid-19 on the environment can be seen on both sides. Different animals are trafficked across international borders thereby human-to-animal or animal-to-human transmission of various diseases can occur. On the one hand, human intervention has been reduced by the lockdown. This has given a boost to the environment and is now compensating for the damage done by man over the last several decades. We also find that the amount of greenhouse gases in the environment is reduced. This has an overall positive effect on the earth's environment. In times of pandemics, people need to dispose off the items they need to protect themselves properly; otherwise, they will find stocks of such items in different places. It affects the environment and other animals. Since all animals are somewhere in the food chain and the food web, it is important to realize that it has a direct effect on humans as well. After all, animals, humans, and the environment are inextricably linked, so human beings need to take care of these three things when considering a pandemic.

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