

Impact of COVID-19 on Environment

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ABSTRACT

Covid-19 pandemic was a gift to nature to heal itself. This study is aimed at finding the positive and negative impact of covid-19 on environment and to find the awareness among people about the negative impact of covid-19 on environment and it was found that covid-19 had created a significant positive impact on our quality of life, but at the same time it has many negative impacts on land due to dumping of waste, especially due to increase in of medical waste and improper disposal mechanism of them, it was also found that there is a great difference in impact with respect to change in population and with respect to change in covid-19 affected rate . All over the world, there are positive impacts of covid-19 which help to reduce many of the air pollutants and heal ozone layer, etc., the government must support the people to follow such green habits in the future to maintain the balance.

KEYWORDS

COVID-19, pathogen, environment, ozone, NO₂, lockdown

INTRODUCTION

The Global outbreak of covid-19 affected human life significantly but also had a greater impact on the environment which factor waited to take a deep breath.

The outbreak of coronavirus disease-2019 (COVID-19) first emerged at the end of December 2019, from the Hunan seafood market in Wuhan City of China, and declared as an international public health emergency in a couple of weeks by the World Health Organization. The transmission of the virus mainly occurred through person-to-person via direct contact or droplets produced by coughing, sneezing and talking. Therefore in order to prevent the spread of disease, the government imposed log down under section 269 and 271 of Indian penal code which restricted the movement of almost all mankind activities and shut down all economic activity except Medicare agencies.

The impact of covid-19 lockdown on environment changes with respect to the efficiency of government measures to control the moment population of the area state or country rate of spread of covid-19 and waste disposal mechanism followed in each area.

After many decades the largest Ozone hole above Arctic Heal itself during covid-19 lockdown but it has not Heal hundred percent at it is a good signal to watch reduction in pollution level due to measures taken to curfew covid-19 infection few scientist consider that if germs are accumulated in air then how can it be considered as pollution free air as jumps are also considered as pollutants.

While comparing between India and China with the help of Geneva green report it was found that Chinese do not with less a significant rise in quality of environment but they are able to dispose the medical waste without being accumulated virus India with less do more than 80% increase in air quality but couldn't make or adopt a best method in waste management.

OBJECTIVES

The aim of this study is

- To find the positive and negative effects of COVID-19 in India.
- To examine the changes in impact of COVID-19 on environment

LITERATURE REVIEW

Positive effects of covid-19 are- improved air quality, low Greenhouse gas emission reduction and water and noise pollution, low pressure on tourist destinations, which resulted in 54.3 percent decrease in NO₂. There are some negative effects of covid-19 which made the task of disposal of mask, sanitary and other Biomedical Waste (for example more than 14.8 million masks are disposed every day in February 2020.)(Rume and Islam 2020)

It was found that air quality was improved which witnessed 85% reduction in PM 2.5 in Ghaziabad , when it is observed using ABOD, MODIS-13 and aqua satellite it was also found that there is 50% reduction in PM 2.5 PM10 and NO₂ and O₃, Benzin . There are a lot of fluctuations in BOD level across Ganga and the river quality was much better than before.(Lokhandwala and Gautam 2020)

Covid-19 lockdown resulted in increase in Ozone, rainfall, wind, medical waste and domestic waste and decreasing temperature, humidity, pollution (45% reduction in black carbon, 57% increase in Ozone and 15.9% decline in suspended particulate matter) in India. (Lokhandwala and Gautam 2020; Hudson 2020)

The indirect negative effects of covid-19 are reduction in recycling, accumulation of waste in higher numbers, contamination of physical spaces. Even though greenhouse gases concentration had decreased, it existed only for a short period which does not lead to sustainable development. (Zambrano-Monserrate, Ruano, and Sanchez-Alcalde 2020)

During covid-19 lockdown USA placed in the countries with low carbon emission, Ganga river was fit for drinking, Yamuna's BOD level is almost null, Venice glowed with transparent water and all the things had happened since many decades, therefore the lessons we could learn from covid-19 are using eco-friendly bicycles, ecosan toilets, carpooling, etc. (Khan, Shah, and Shah 2021)

Reduction in greenhouse gases is a good signal of covid-19, but there is an increase in Environmental waste especially mask, Lockdown also resulted in sharpest decline in renewable energy resources by 28% due to dismissal of workers, delay of equipment, and delay of consumers. Therefore there is an urge to make laws to regulate the renewable energy sector. (Eroğlu 2020)

Some miracles happened in India after 30 years are due to covid-19 lockdown. Few of them are reductions in PM 2.5, PM 10, NO₂ and SO₂. There is a good dissolution of oxygen in Ganga with less E coli concentration, Himalayan range was visible from 200 kilometers, Mount Kanchenjunga was visible from Siliguri and Mount Everest was visible from Bihar. (Shankar and Rodrigues 2011)

When observed through Landsat and Sentinel 2 satellites, it was found that there are changes in timing of Snow melt due to changes in the sources of water in Indus river basin, which may affect the water supply & it is also observed that Manhattan witnessed Clearwater and Hudson river had 40% drop in turbidity, but this might not exist for a long. (Hoffman and Parker 1993)

Treatment of Industrial and vehicular movements improve the quality of stratosphere and helped many rivers to retrieve itself , for example there is a great decrease in turbidity levels of Sabarmati river where there was 36.4 8 percentage of decrease in suspended particulate matter that is 8.0 milligrams per liter.(Aman, Salman, and Yunus 2020)

Due to increase in the usage of mask surgical gloves sanitizers there is a great increase in the level of emission of hydrocarbons, therefore government measures for Limited and proper disposal mechanisms should be adopted in order to prevent the accumulation of waste and emission of toxic elements outside.(Saadat, Rawtani, and Hussain 2020)

Lockdown and quarantine introduced an antivirus built environment that consists of social distancing,etc. Lessons that we could learn from covid-19 are low density in the cities, decentralization of authorities, reformation in sanitary methods, urban renewal, green spaces, low rise building, touch less Technologies, less usage of cars and adopting cycling and walking for shorter distances.(Ahsan 2020)

Due to decrease in economic activities both the production and consumption rate is reduced, therefore there is a balance maintained between Producers and Consumers. That is there is no conception, so that there is no demand, since there is no usage, there is no emission and reduced pollution by fossil fuels.(Wang and Su 2020)

While collecting data from centers for Disease Control and if it was found that there is a significant correlation between PM 2.5, PM10, SO₂, NO₂ , Pb,CI and Si with covid-19 in California. The initial elements had a significant decrease where there was an increase in VOC due to increase in the medical Apparatus construction.(Bashir et al. 2020)

Innovative and PM. the same in metropolitan cities whereas wind speed humidity and covid-19 has a weaker correlation and decrease in NO₂ seems to be precursor for Ozone which is not perfectly good, but it is good for auto filling of Ozone holes. Higher concentrations of PM 2.5 and PM10 make the spread of infection easier as they act as Tarzanvector for transmission.(“Website” n.d.)

Before lock down over the past decade there is the five time jump in carbon footprints which drop completely during lockdown. Ganga & Yamuna became capable of Habitat fishery which was not achieved by many goals in the past 20 years.(Gautam et al. 2020)

H 2020 Heera project found that due to intensive livestock farming transmission of zoo tonic pathogens is high and since many migrants came back to home, there has been an increase in usage of firewood and resulted in an increase in the black soot level in certain rural areas.(Barouki et al. 2021)

Covid-19 lockdown helped in witnessing clear Sky, reduction in carbon emission, cleaner breathing air (71%), 27 points for Ganga ,etc. all these things seems to be believable in inevitable positive impacts so that we should adopt the same go green concept in future too.(Debata, Patnaik, and Mishra 2020)

High production of livestock results in an increase in mosquito vectors and those vectors reproduce rapidly in high humidity that induce spread of new contagious diseases therefore measures should be taken in a Wholesome manner to control all types of diseases.(“Zoonotic and Parasitic Infections,” n.d.)

While observing through 22 air quality stations in Mumbai there was a reduction in various pollutants during lockdown which resulted in good and enough rainfall, but due to reduced evaporation which may cause decrease in the Dew Point and become a serious issue in the near future.(Singh and Chauhan 2020)

Higher concentration of particulate matter seems to be an efficient carrier of the pathogen and may result in new cases, increasing the consumption of medi products will again increase the concentration of particulate matter which acts as a vicious cycle.(Singh and Chauhan 2020; Comunian et al. 2020)

METHODOLOGY

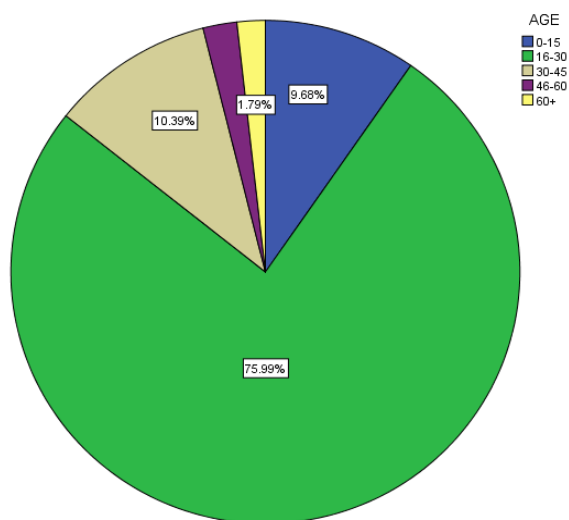
This study is based on collecting information from primary and secondary data. Here, the secondary data is collected from various books and literary works of scholars and researchers, whereas the primary data for the study is collected from 280 sample respondents through the convenient sampling method. The research instrument used to collect the primary data from the sample respondents is- well-structured questionnaire. Age, gender, educational qualification, and space of living are used as the independent variables, whereas the dependent variables are the opinion of the public on various questions related to impact of COVID-19 on the environment .This study uses graphs, tables, and Chi-square tests for meaningful analysis.

HYPOTHESIS

Null: There is no significant relationship between the space of living of the respondents and their awareness of the negative impacts of COVID-19 on the environment.

Alternate: There is a significant relationship between the space of living of the respondents and their awareness on negative impacts of COVID-19 on the environment.

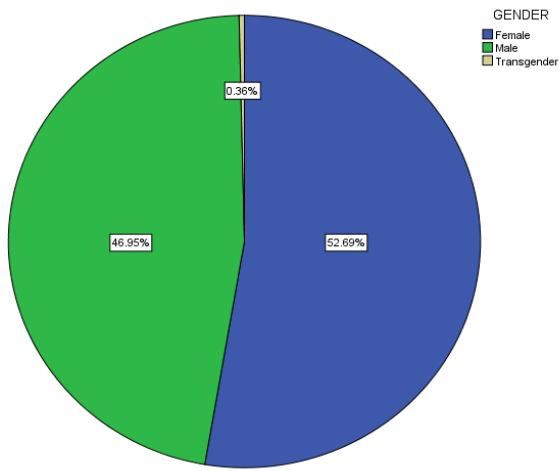
ANALYSIS



Legend:

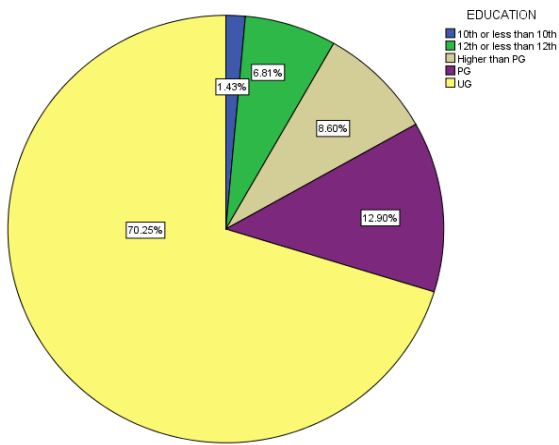
Fig.1 represents the distribution of the sample population with respect to their age group.

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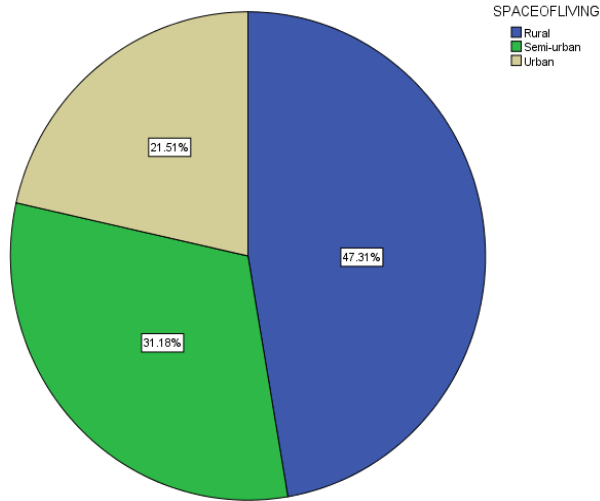
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Fig.2 represents the distribution of sample population with respect to their gender.



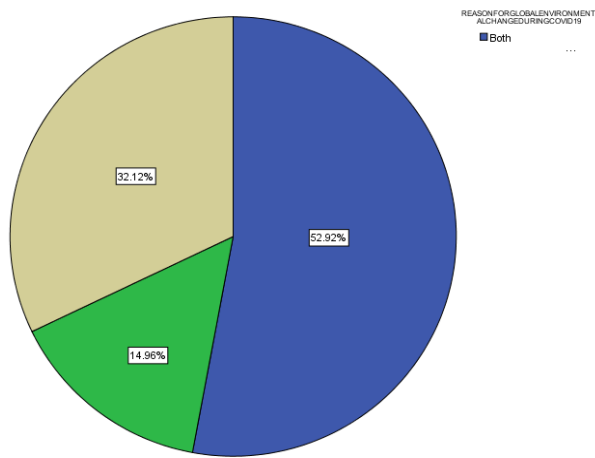
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Fig.3 represents the distribution of the sample population with respect to their educational qualifications.



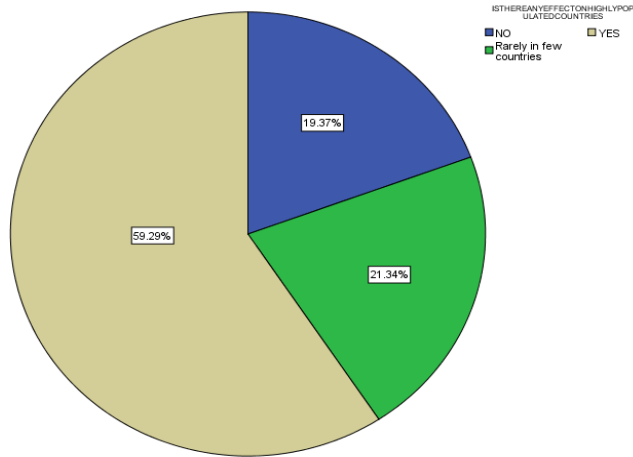
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Fig.4 represents the distribution of sample population with respect to their space of living.



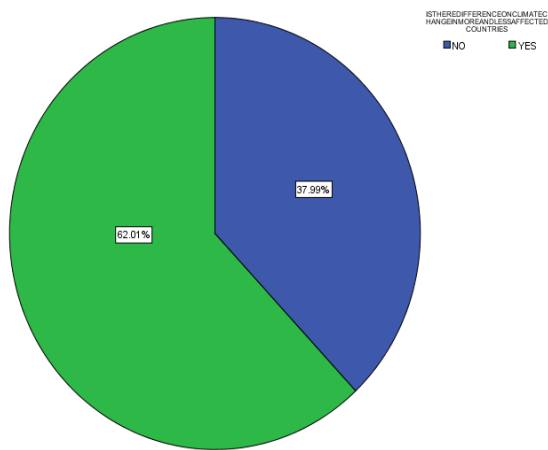
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Fig.5 represents the distribution of the sample population with respect to their opinion on the reason for global environmental change during COVID-19 Pandemic.



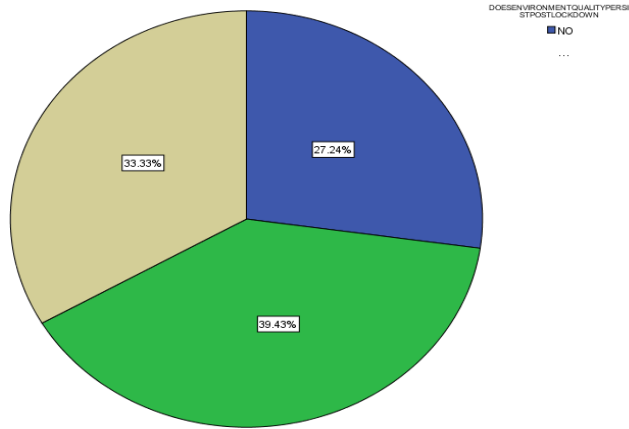
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Fig.6 represents the distribution of sample population with respect to their opinion on the presence of changes in environment quality with respect to highly populated and less populated countries.



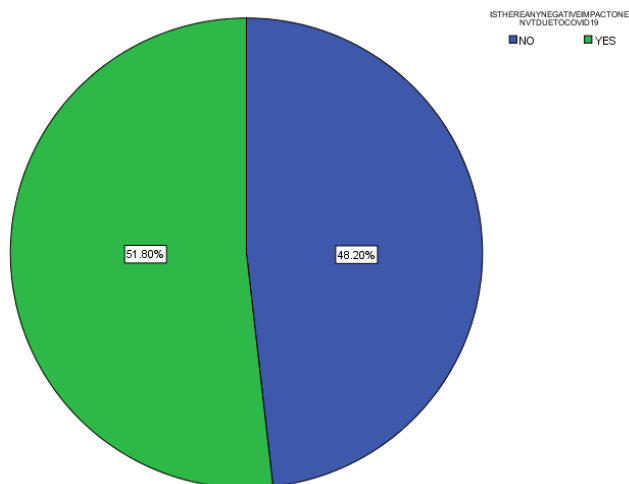
Legend:

Fig.7 represents the distribution of sample population with respect to their opinion on differences in climatic change with respect to highly affected and less affected countries.



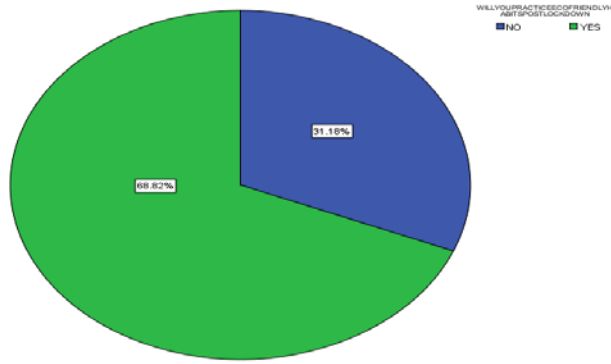
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Fig.8 represents the distribution of sample population with respect to their opinion on persistence of environmental quality post lockdown.



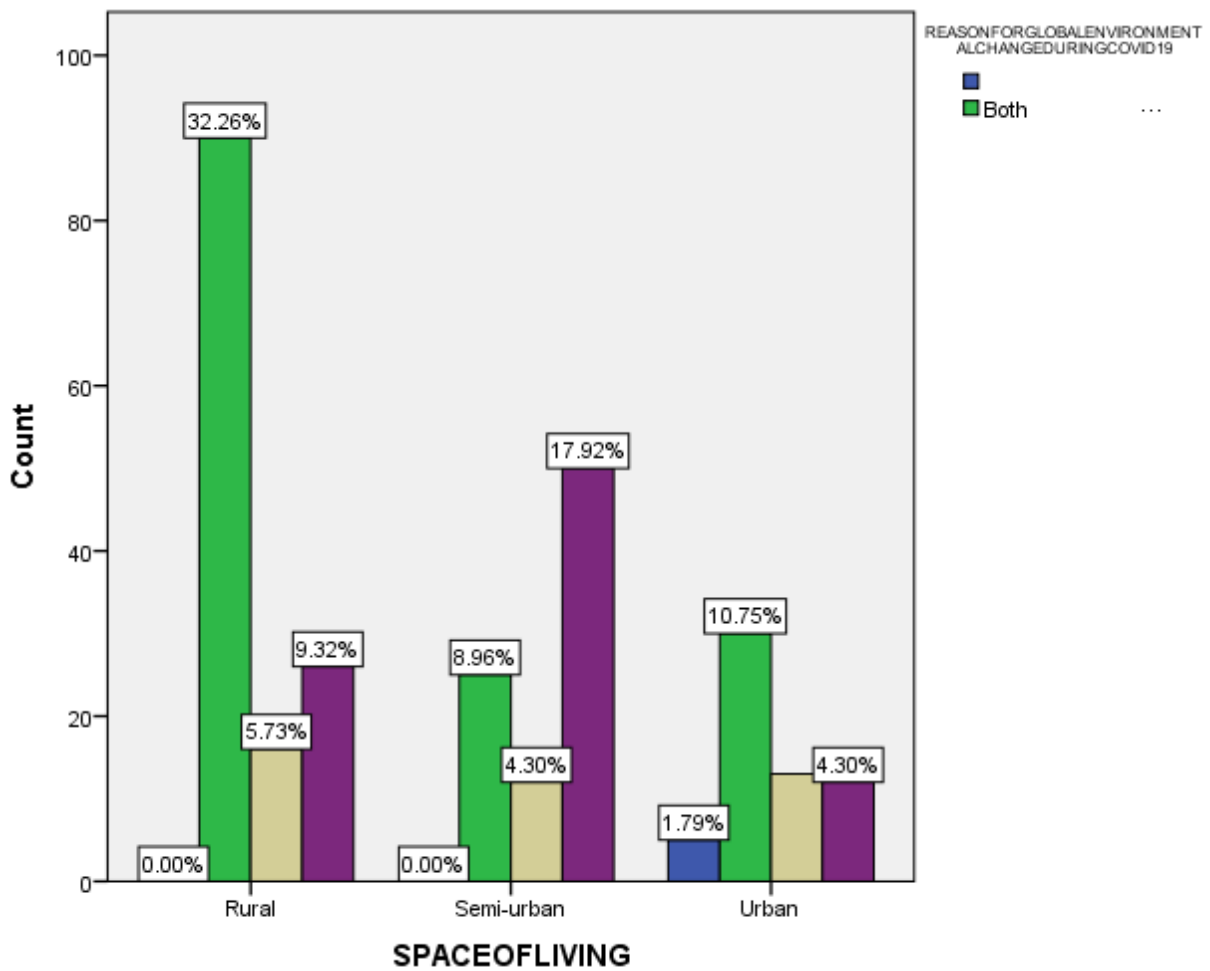
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Fig.9 represents the distribution of sample population with respect to their opinion on the presence of negative impact due COVID-19 on the environment.



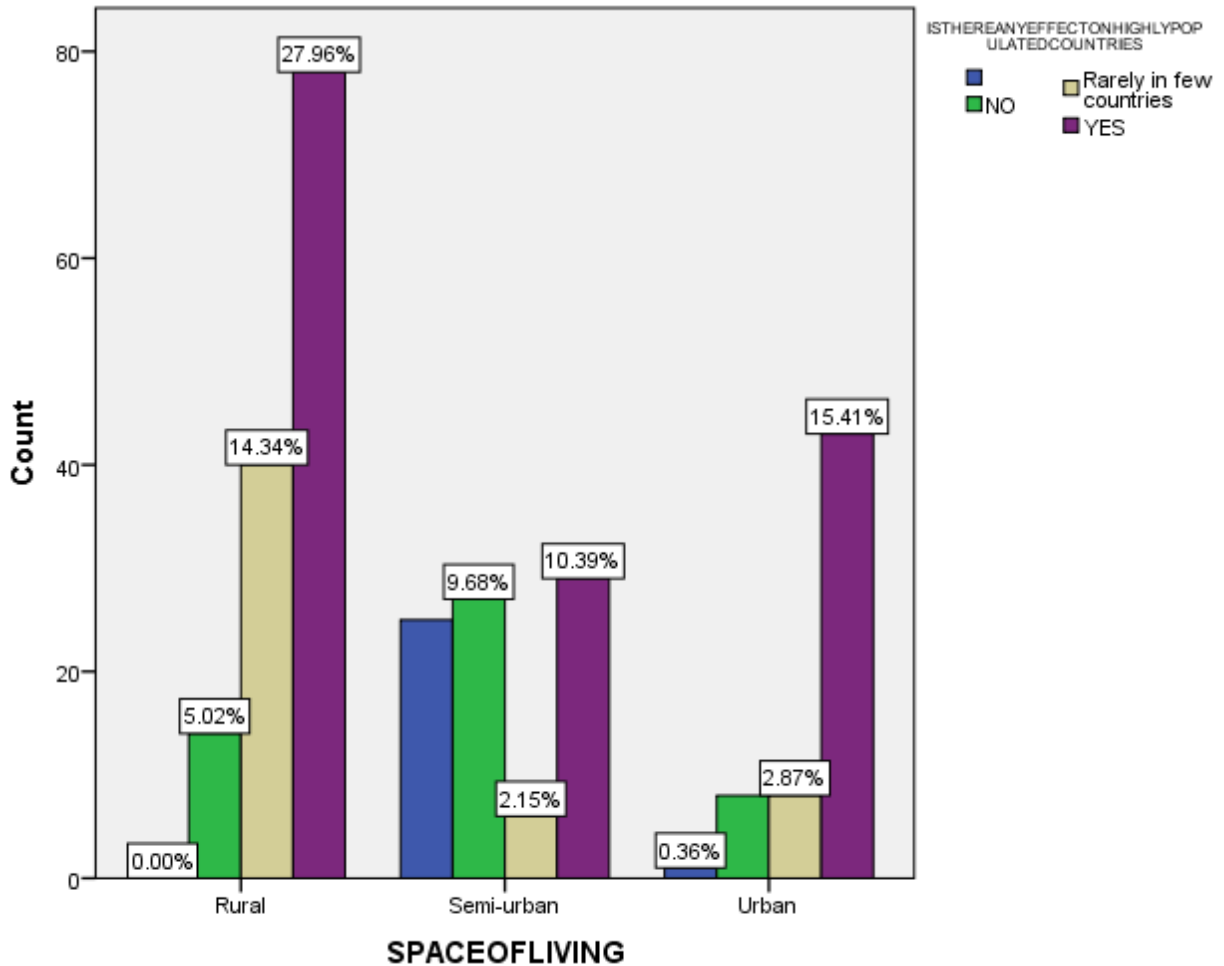
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Fig.10 represents the distribution of sample population with respect to their opinion on continuing ecofriendly habits post lockdown .



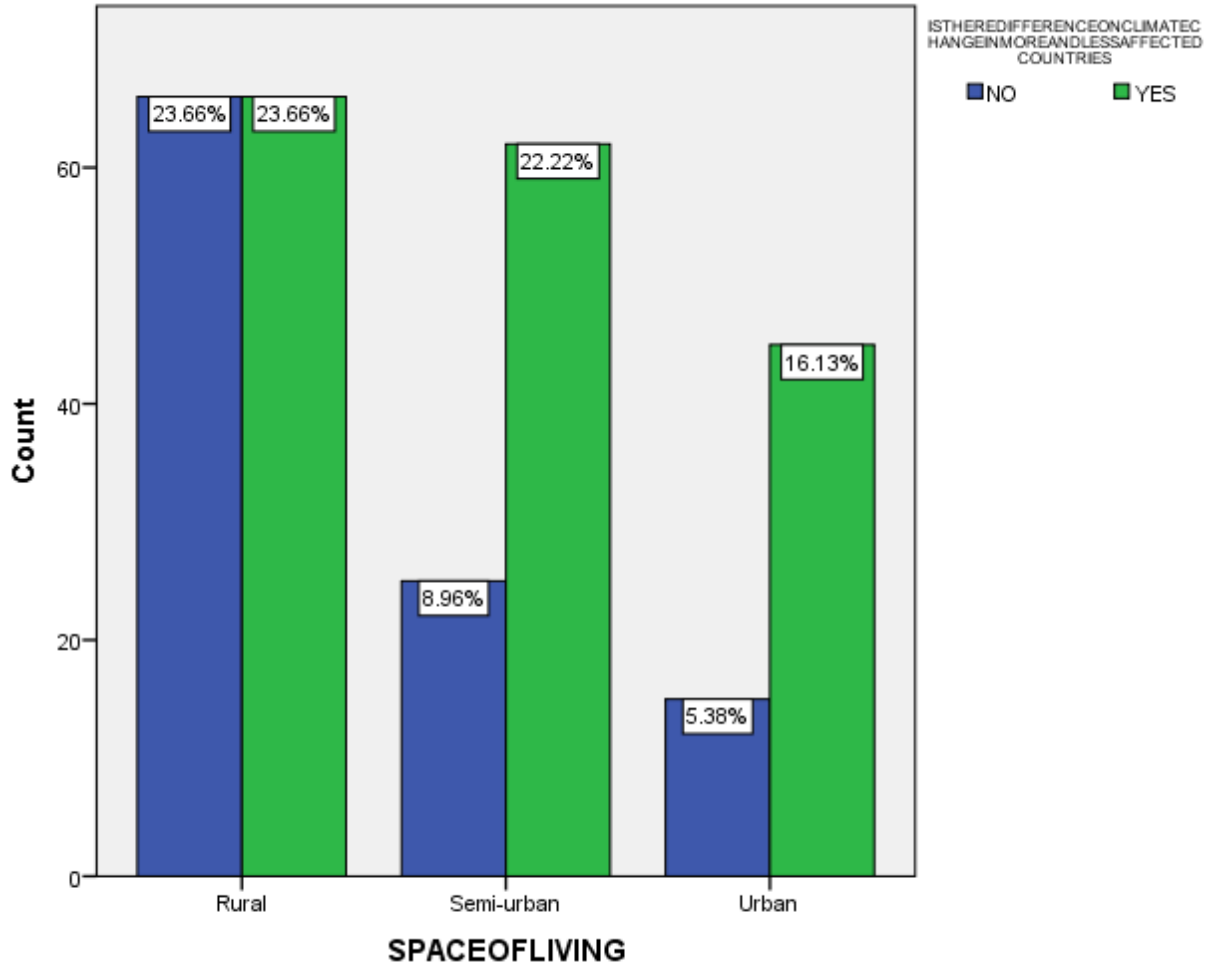
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Fig.11 represents the space of living distribution of the sample population and their opinion on the reason for global environmental changes during COVID-19 pandemic.



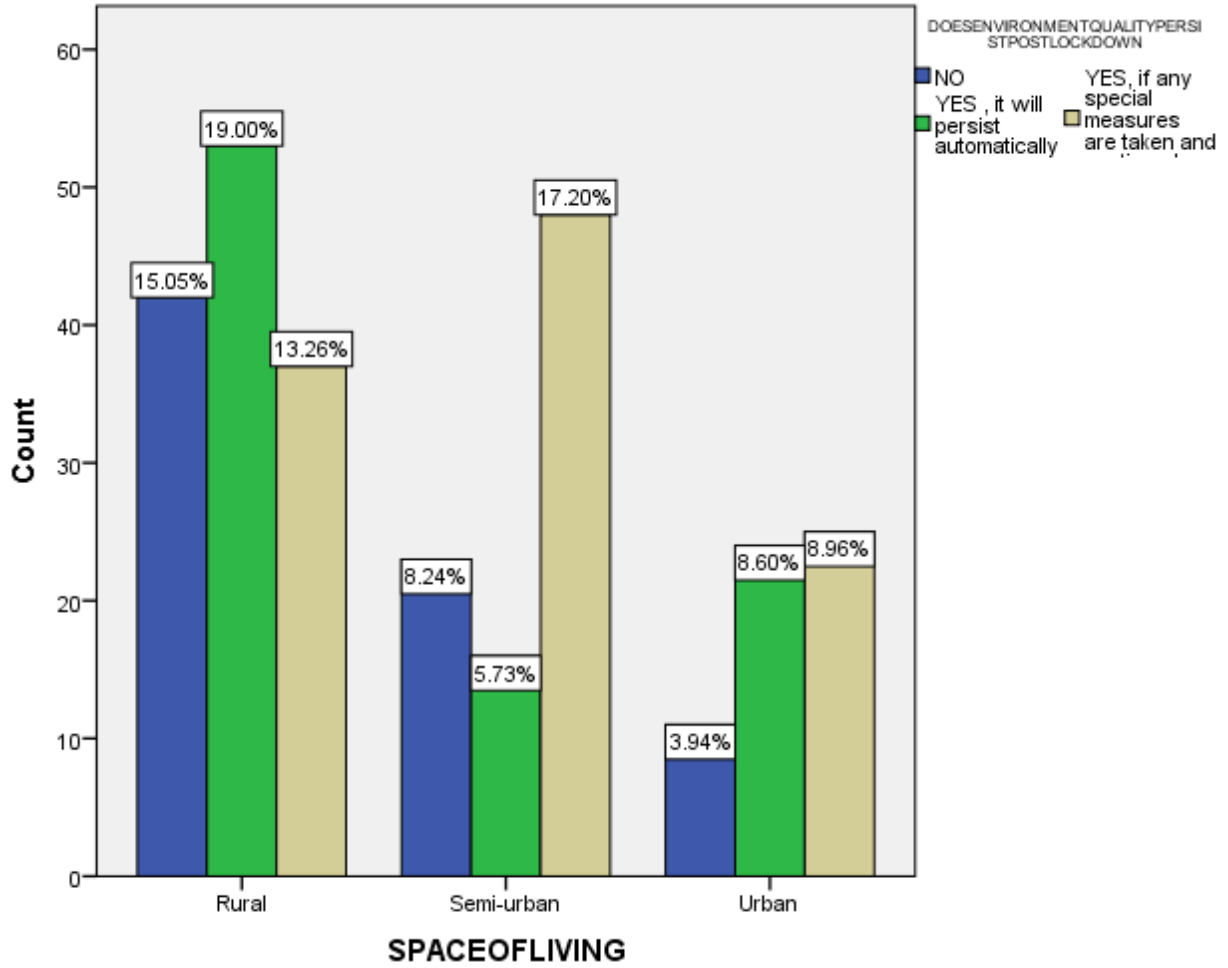
Legend

Fig.12 represents the space of living distribution of the sample population and their opinion on changes in environmental quality in high & less populated countries.



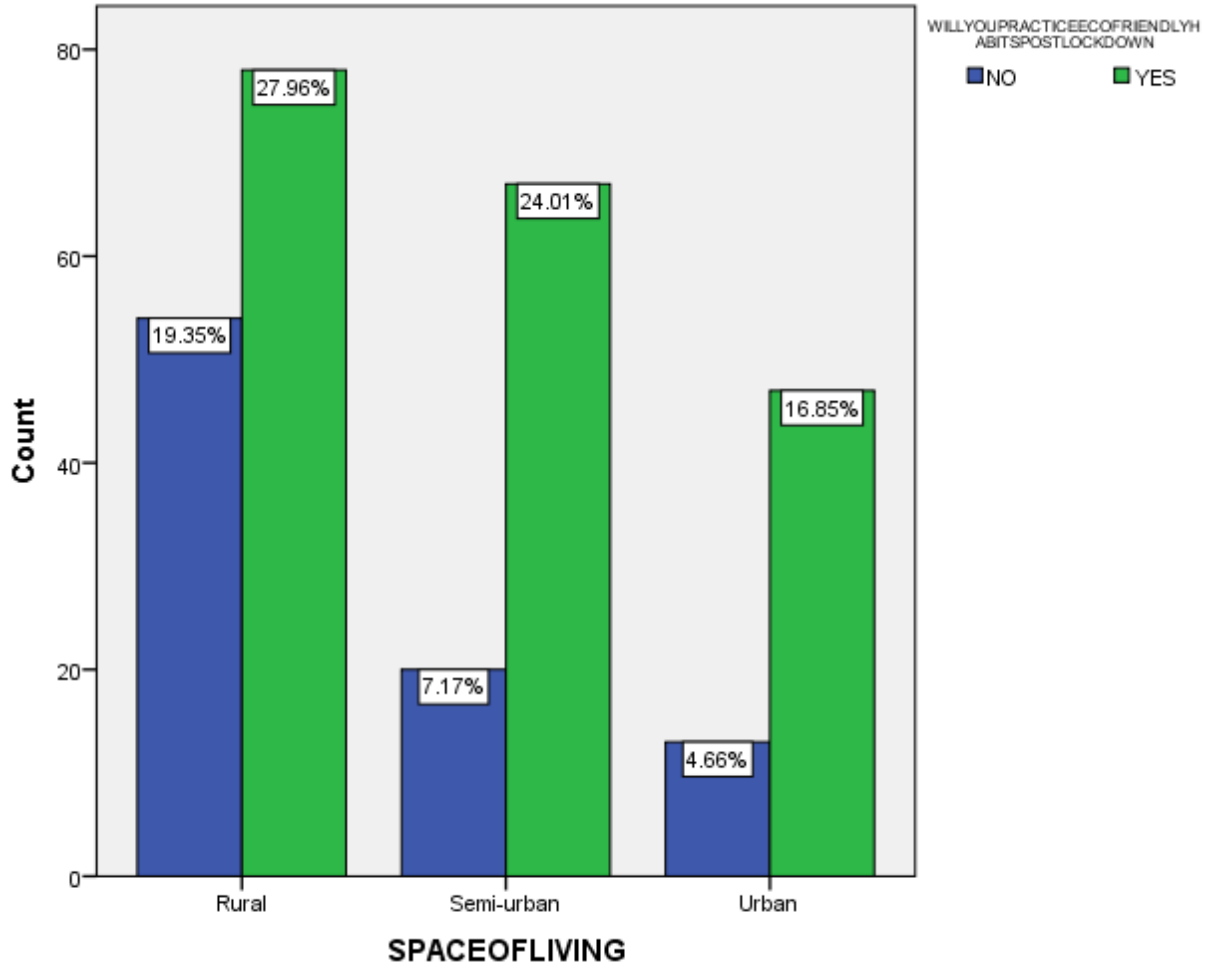
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Fig.13 represents the space of living distribution of the sample population and their opinion on differences in climatic changes with respect to highly affected and poorly affected areas.



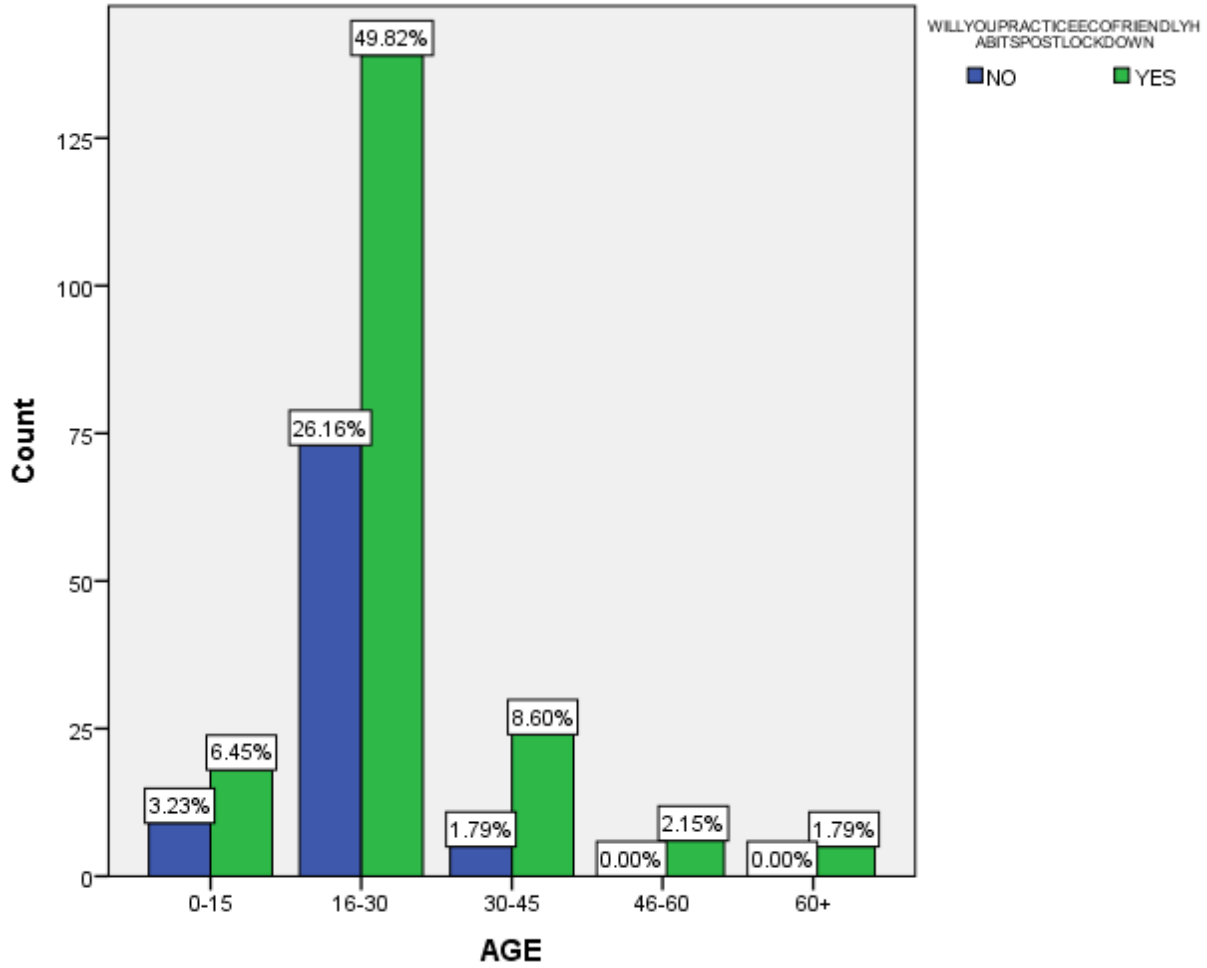
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Fig.14 represents the space of living distribution of the sample population and their opinion on persistence of environmental quality post lockdown.



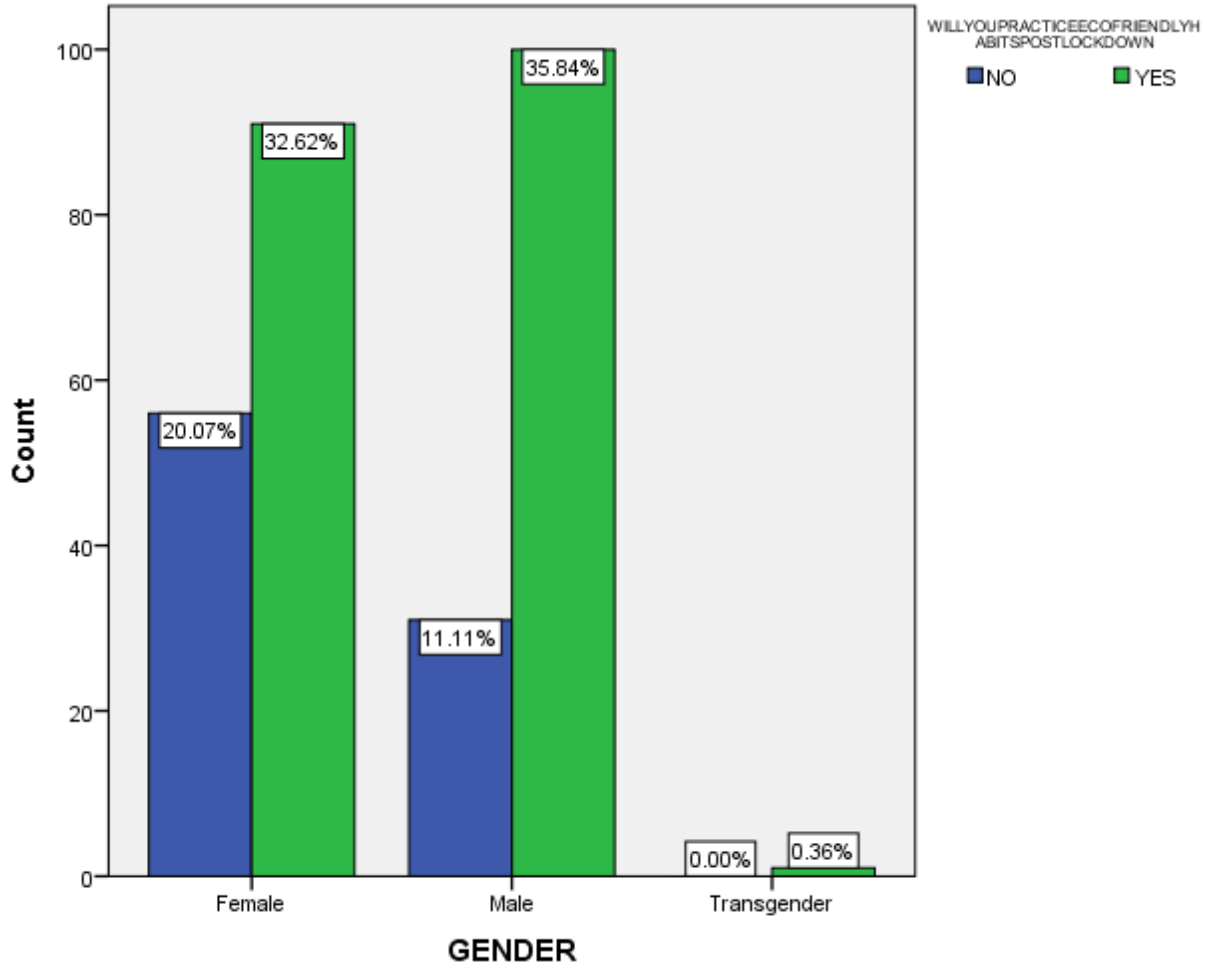
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Fig.15 represents the space of living distribution of the sample population and their opinion on continuation of eco friendly activities post lockdown.



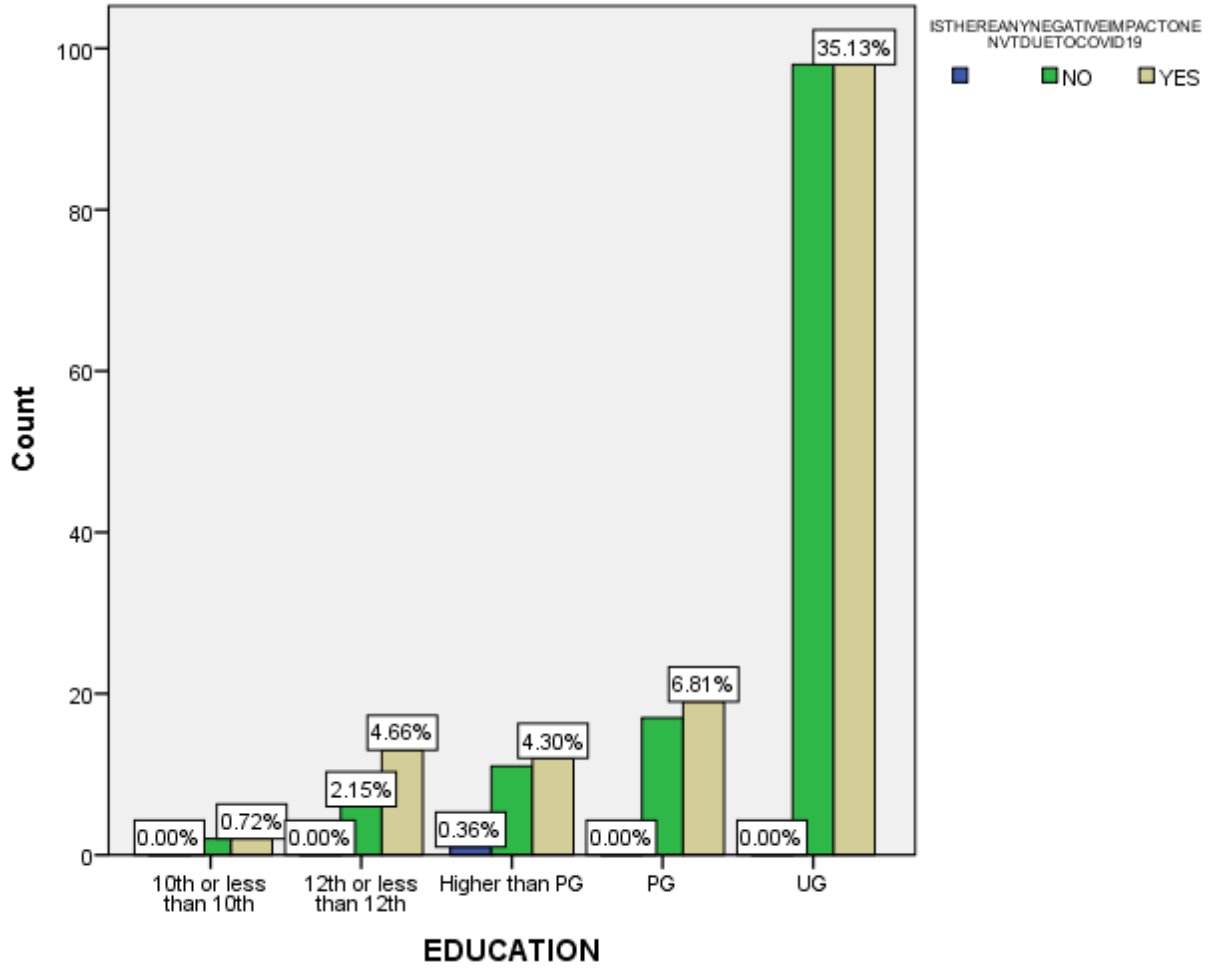
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Fig.16 represents the age distribution of the sample population and their opinion on continuation of eco friendly practices post lockdown.



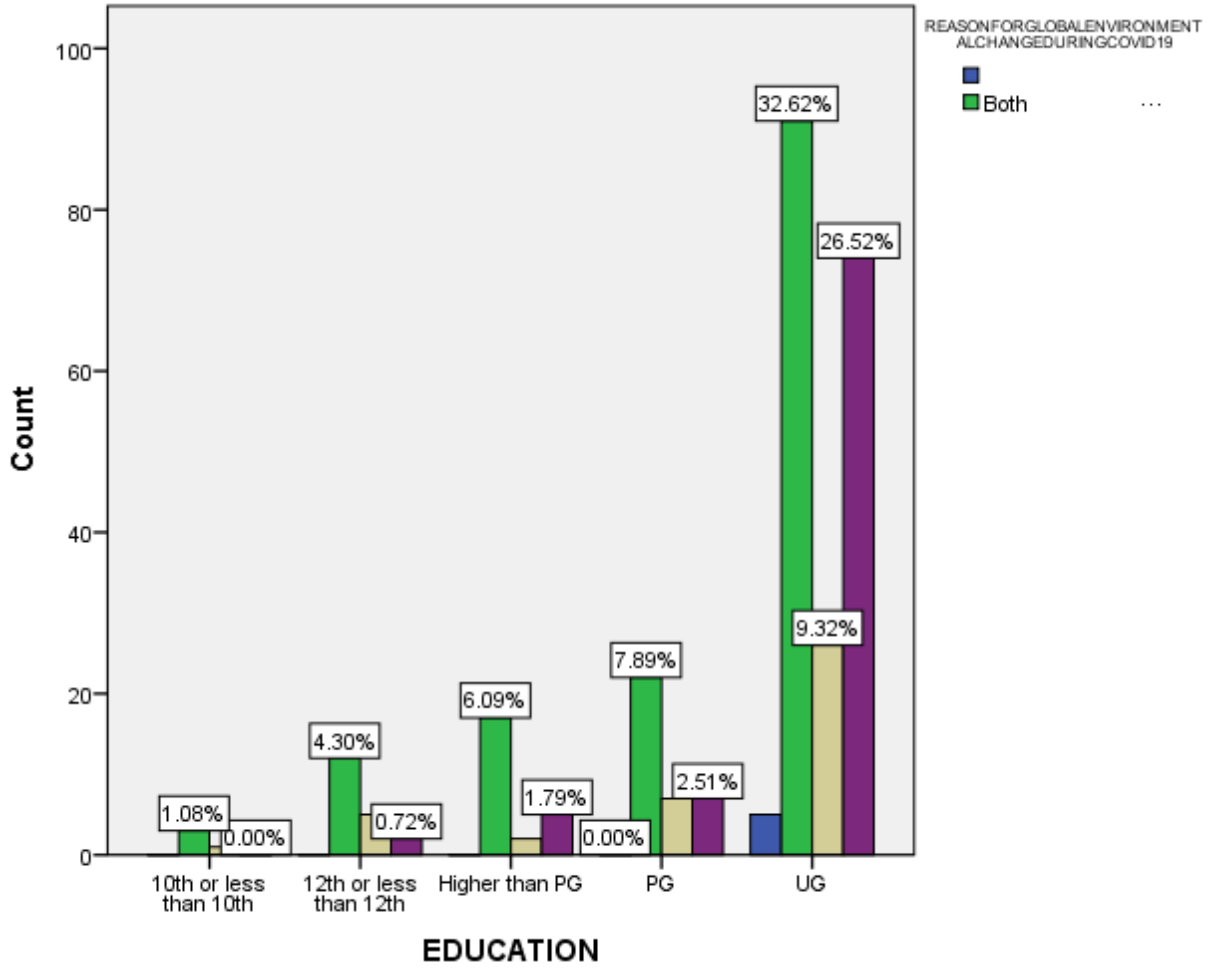
Legend

Fig.17 represents the gender distribution of the sample population and their opinion on continuation of eco friendly activities post lockdown.



Legend

Fig.18 represents the educational qualification distribution of the sample population and their opinion on the presence of negative impacts on the environment due to COVID-19.



Legend

Fig.19 represents the educational qualification distribution of the sample population and their opinion on the reason for global climatic change.

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SPACEOFLIVING * ISTHEREANYNEGATIVEIMPACTONENVTDUETO COVID19	279	100.0%	0	0.0%	279	100.0%

SPACEOFLIVING * ISTHEREANYNEGATIVEIMPACTONENVTDUETO COVID19 Crosstabulation

Count

		ISTHEREANYNEGATIVEIMPACTONENVTDUETO COVID19			Total
			NO	YES	
SPACEOFLIVING	Rural	1	48	83	132
	Semi-urban	0	56	31	87
	Urban	0	30	30	60
Total		1	134	144	279

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	17.319 ^a	4	.002
Likelihood Ratio	17.893	4	.001
N of Valid Cases	279		

a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .22.

Legend

Fig.20 represents the correlation between the space of living of the sample population and their awareness of the negative impacts of COVID-19 on the environment.

RESULTS

From fig.1, we could infer that majority of the respondents are from age group of 16-30(75.99%), followed by the age group of 30-45(10.39%), 0-15(9.68%), 46-60(1.79%), 60+(1.79%).

From fig.2, we could infer that the majority of respondents are female (52.69%), followed by males (46.95%), and transgender (0.36%)

From fig.3, we could infer that the majority of the respondents had educational qualification with UG (70.60%), followed by PG (12.90%), higher than PG (8.25%), 12th (6.81%) and 10th (1.43%).

From fig.4, we could infer that the majority of the respondents belong to rural areas (47.31%), while the remaining are from semi-urban (31.18%) and urban areas (21.51%).

From fig. 5, we could infer that majority of the respondents say that both closure of industries and poor movement of vehicles resulted in global environmental change (52.9 2%) whereas, 32.1 2% say that only Poor moment of vehicles is the main cause for increase in Environmental quality

From fig. 6, we could infer that the majority of the respondents said that there is an impact on highly populated countries too (42.2 9%) while 19.3 7% say that there is no impact in highly populated countries.

From fig. 7, we could infer that 52.01% of the respondents say that there is a significant difference on the impact on climate due to covid-19 in higher and less affected countries while 37.9 9 oppose that .

From fig. 8, we could infer that majority of the respondents (39.4 43%) say that environmental quality purses post lockdown only if necessary measures are taken while 27.2 4% say that environmental quality will degrade after lockdown.

From fig. 9, we could infer that 51.80 % respondent says that there are negative impacts of covid-19 on Environment while 48. 20% see that there is no negative impact of covid-19 on Environment

From fig.10 and we could infer that 68.8 2% of the people will practice ecofriendly activities post to lock them while the remaining 31.8 in person don't

From fig. 11, we could infer that majority of the rural and urban population say that both Industrial and vehicular emission shutdown are the reason for quality environment while remaining say that industrial shutdown is the major cause (17.92%)

From fig. 12, we could infer that the majority of respondents in all areas agree that covid-19 has impacts on highly populated countries too.

From fig. 13, we could infer that many of the respondents in all the areas agree that there is a change in impact on less and more affected countries.

From fig. 14, we could infer that the semi-urban and urban population say that environmental quality persists post lockdown only if necessary measures are taken and the rural population (19%) say that it will cause it automatically.

From fig. 15 we could inform that respondents in all the areas that he will say that they will try to continue ecofriendly practices forced to lockdown

From fig. 16, we could infer that a majority of respondents from the age group of 16 -30 (40.82%) and others say that they will practice ecofriendly activities post lockdown.

From fig. 17, we could infer that a majority of the respondents both male (35.84%) and female (32.6%) are willing to practice ecofriendly activities post lockdown.

From fig. 18, we could infer that equal number of respondents in all educational group equally support and oppose the negative impacts of covid-19 on Environment

From fig. 19, we could infer that most of the people in all educational qualification groups say that both vehicle and industrial shutdown resulted in reduction of pollution

From fig. 20, we could find there is a significant relationship between the space of living of the respondents and their awareness on negative impacts of covid-19 on the environment.

DISCUSSION

Covid-19 came to light in December 2019 and caused an unpredicted impact on many countries even if it had an adverse effect on mankind, it had many indirect effects on the environment. The major reason for such a steep decline in environmental pollution is due to closure of industries and restrictions on movement of vehicles (**fig. 5**). Even during the imposition of lockdown many vehicles were on road and especially in semi urban areas (**fig. 11**) this is usually due to poor enforcement of government restrictions in lockdown, yet due to industrial shutdown there is a steep decline in SO₂ and NO₂ emissions especially in urban areas. (**Fig. 11**). Many people say that there is no negative impact of covid-19 on environment (**fig. 9**), but the real fact is that they were not aware of the ill effects of covid-19, many activities that are made to conserve the ecosystem are restricted that lead to an increase in illegal waste dumping and logging. A significant number of people living in all areas are aware of this ill effect (**fig. 16**). On comparing educational qualifications there is an equal support for positive and negative impacts of covid-19 on the environment. Mask and other medical waste had become a great threat to the environment and there is a great significance between space of living and negative effects of covid-19 (**fig. 20**) because in highly populated countries that is the high density of population (**fig. 6**) in parts created than in other places (**fig. 12**) due to consumption of high product counts. Recycling was also destructed during covid-19 which made the problem more risky, there is also a change seen in high and less affected countries (**fig. 8**) respondents in all areas agree with the above statement (**fig. 13**), this is because in highly affected areas at quality is good and clean due to perfect closure of everything, while medical wastes were in high number similarly in less affected areas vehicles were moving normally and do not make any changes in air quality but there is no increase in waste accumulation. Majority of the respondents in all age groups (**fig. 15**), all places, (**fig. 16**) and gender (**fig 17**) say that they will try to practice eco-friendly habits even after Locked (**fig10**) , but they also added that environmental quality will be maintained post lockdown only if government takes necessary measurement (**fig. 8**) especially the rural and urban dwellers supported this (**fig. 14**), if there is no special restrictions and if the pandemic seizes the pressure on the environment will resume and even the finances less and poorly available for the greener investment since more money is spent already on health sector amid covid-19 .

LIMITATIONS

The sampling method followed in this study is convenient sampling. The study is unable to collect data through random sampling methods due to the inconveniences created by the COVID-19 lockdown measures.

CONCLUSION

Covid-19 is a pandemic that prisoned the whole world but indirectly helped all human beings and other organisms. It helped the environment to restore back to its normalcy. This study is aimed at finding the negative and positive impacts of covid-19 and the changes in impacts and awareness among people and it was found that it had positive effects towards their quality and negative effect towards quality of land due to increase in medical waste in landfills, but these impacts also had a significant difference in highly affected and less affected areas. The major change is that Ozone Healed itself during lockdown and the year 2020 is considered as a great super year for biodiversity. The government must enact and formulate essential measures to maintain the air quality and if not the activities again will resume the risk of affecting the environmental quality again.

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