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Case Study: Modern Pollution Concept

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ABSTRACT

The 20th century known as "developing age" because many of the countries are under development or they are well developed. So at one side the term technology born &Accrue but in other side problems are created like pollution. Still we are fighting with many of problems like plastic & marine pollution, deforestation, air pollutant is drastically affected everywhere. Also new pollution concepts are generated nowadays as like covid 19 waste pollution & space pollution all these are modernCatastrophe & all these things are included in modern pollution concept. Therefore the aim of case study is exploration &data analysis of recent or modern pollution problems & recommendation of solution for same.

Keywords: developing age, covid 19, Catastrophe, modern pollution concept, accrue

INTRODUCTION:

Development & pollution directly interconnected with each other. During development many nations are exploring the natural resources & set up the huge refineries. Also industrial revolution includes the major part of chemical industry. 70,000 different chemicals are produces throughout the world. In Europe more than 60,000 chemical industry are present which creates 3.3 billion of employment. also all these companies are second largest consumer of energy in manufacturing and spends over $5 billion annually on pollution abatement.In the early 1980s government research revealed that many chemicals on the market had not been sufficiently tested to allow a complete determination& analysis of their potential hazards (NAS, 1984)& toxicity Much effort has been spent over the ensuing years on testing and assessing chemicals, and the significant government/chemicals companies effort is recently underway in OECD to collect information on high production volume chemicals.The number of chemicalson the market

From the Table 1, we can see that , more than half of the chemicals industry sites in Japan employ less than 30 workers. But in the European Union, 70% of the firms have nine or fewer employee's (see Table 2), yet they make up only 3% of total sales. Small facilities play an vital role in the production of fine chemicals, the raw materials for pharmaceuticals and some crop protection and other products like drugs. They are also involved in the production of adhesives, coatings, institutional and industrial cleaning compounds, fertilisers polymers some personal care products like cosmetics and many other speciality & fine chemicals.Percentage share of worldchemicals industry output (1970 and 1998)

Nowadays Almost every country has a chemicals industry, but the huge production is accounted for by a small number of industrialised countries (see Figure 1), with currently approximately 80% to 90% of the world's total output produced by only 16 countries such as US, Japan, Germany, China, France, the UK, Italy, Korea, Brazil, Belgium/Luxembourg, Spain, the Netherlands, Taiwan, Switzerland and Russia. Similarly OECD countries accounted for 79% of worldoutput in 1998, this is 5% less thanin 1970.

Fig no 1. Percentage share of world chemicals industry output (1970 and 1998)

Table 1
Chemicals industry in Japan

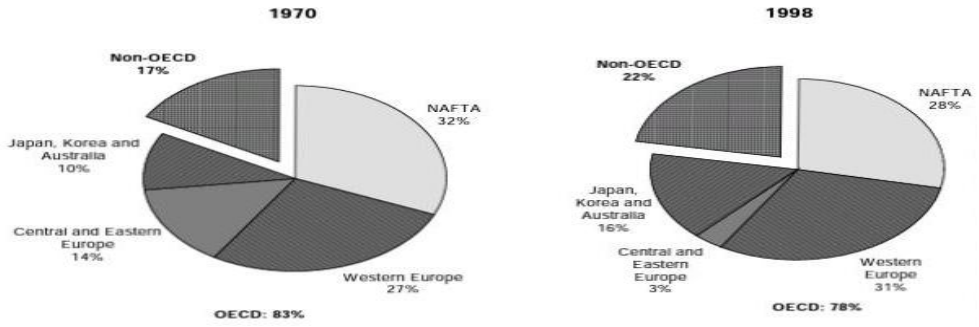
Number of employees at each site	Total sites	Total employees	Sales (million yen)
4-29	3170	42,744	1,516,604
≥30	2256	340,070	21,706,666

Source: Japan's Census of Manufactures 1998 (MITI, 2000)

Table 2
Chemicals industry in the European Union

Number of employees at each site	1-9	10-99	100-249	250-499	500+
Sales (%)	3	10	10	14	63
Number (%)	70	22	4	2	2

Source: UNECE The Chemical Industry in 1999, Annual Review (UNECE,1999)



Overall all man made activities are responsible for pollution & other environmental problems. Basically water pollution air pollution and noise pollution are common type of pollution. As for the growing development other problems are arises like ozone layer depletion, space pollution, plastic pollution, marine pollution, deforestation etc. Alsorecently a new problem get ariseSuch as covid 19 waste pollution.After 1970 the urbanisation get increased hence for the construction requirement of timber is rises which leads to exploration of forest where waterdemand is high. Similarly everyday tremendous amount of domestic waste is created which is not disposed properly therefore it is dangerous for although humankind and environment. Normally whenever the discussion on pollution is held then mostly we'll talk about industrial activities but the hidden part is agricultural activities. To achieve high yield farmers are use pesticides, fertilisers, herbicide's etc. Which obviously increase yield but majorlypollute the land. That's why the world is facing global problems like acid rain, ozone layer depletion, Climate change, space pollution, global warming, carbon dioxide emission, greenhouse gases affect etc. Therefore our case study is based on modern pollution concept analysis the solution for that and explore the world impact.

Covid 19 waste pollution:

corona virus diseases (covid 19) is cursedoutbreak. Every human being get impacted by it. The outbreak of coronavirus disease-2019 (COVID-19) firstly emerged at the end of December 2012, in 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 (WHO). It is and know as infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).So the COVID-19 has brought about several effects on the environment and climate. Due to movement restriction (lock down) and a significant slowdown of social, industrial and economic activities, air quality has improved in many cities
& towns with a reduction in water pollution in different parts of the world. But increased use of PPE (e.g., face mask, hand gloves etc.), their haphazard disposal, and generation of a huge
Amount of hospital waste has negative impacts on the environment. That's why we can say that,both positive and negative environmental impacts of COVID-19 are present.

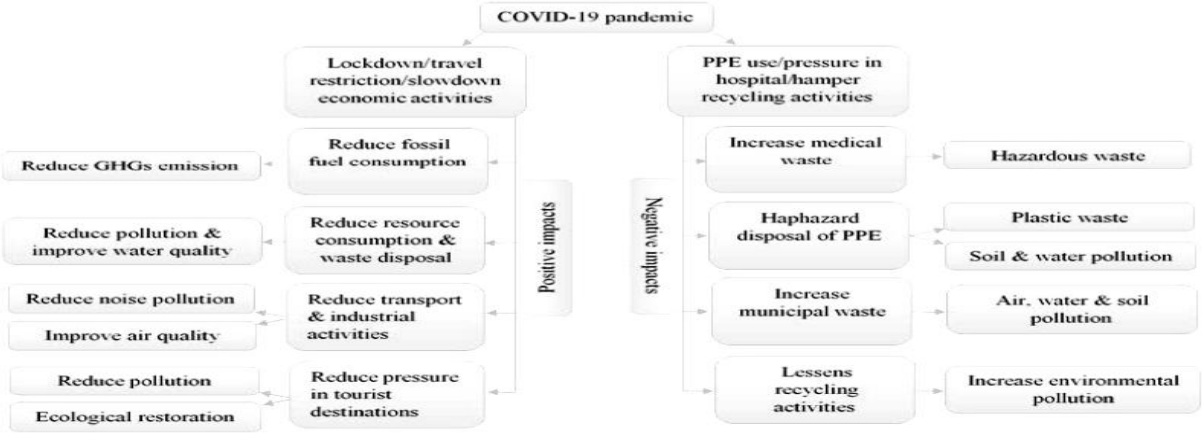


Fig no 2. Positive and negative environmental effects of COVID-19 pandemic

Positive environmental effects of coved 19:

During pandemic most of industries, transportation has stopped hence suddenly co2 & greenhouse gases emissions get reduced.If we compare with this time of last year, levels of air pollution in Ney York has reduced by nearly 50%.Also nearly 50% reduction of N_2O and CO occurred due to the shutdown of heavy industries in China & japan. Similarly the emission of NO_2 is one of the key indicators of global economic activities, which indicates a sign of reduction in many countries (e.g., US, Canada, China, India, Italy, Brazil etc.) Cause of recentlock down. According to UK based

climate science and policy website mainly the recent crisis of COVID-19 reduces 25% CO_2 emission in China, Japan and nonetheless below the normal limit more than two months after the country entered lockdown. They also presented that, the pandemic could reduce 1,600 metric tons of CO_2, equivalent to above 4% of the global total in 2019.

Simultaneously Water pollution is a common problem of a developing country like India, Pakistan, shrilanka&Bangladesh, where domestic and industrial wastes are dumped into rivers& sea without any treatment. During lockdown all industrial activities are stopped hence upto certain level the water pollution get reduced. Mostly in India the river ganga & yamuna are showing significant purity compare to previous all years. Around 65 % of water quality get improved. In Haridwar and Rishikesh was ascribed to the sudden drop of the number of visitors and it found 500% reduction of sewage and industrial effluents. According to the real-time water quality monitoring data of the Uttarakhand Pollution Control Board of India demonstrated a report & they explain all the physicochemical parameters like pH (7.4–7.8), dissolved oxygen (DO) (9.4–10.6 mg/L), biochemical oxygen demand (BOD) (0.6–1.2 mg/L) and total coliform (40–90 MPN/100 mL) of the river Ganga was found within the surface/land water quality standard of India. But Usually large amount of solid trashes is generated from construction, by processing and from manufacturing process which directly responsible for water and soil pollution, also reduced. Moreover, owing to the reduction of export-import business, the movement of merchant ship, transportation and other vessels are reduced globally, which also decreases the emission as well as marine pollution.

World Health Organization predicted that in Europe alone, around 100 million people are exposed to high noise levels, above the recommended limit over. An anthropogenic noise pollution has adverse effects on wildlife& biodiversity through the changing balance in predator and prey detection and avoidance. Unwanted noise also negatively effects on both of Vertebrate& invertebrates that help to control environmental processes which are vital for the balance of the ecosystem. However, the quarantine and lockdown measures mandate that people who are mostly stay at home and reduced economic activities and communication worldwide, which ultimately & progressively lower noise level in most cities& towns. Similarly, local administration imposed a ban on public gathering, collaboration and tourist arrivals at Cox's Bazar sea beach, known as the longest unbroken natural sand sea beach in the world. As a result of restriction, the colour of sea water is changed, which usually remain turbid because of swimming, bathing, playing and riding motorized boats Nature gets a time to assimilate human annoyance, and hence the pollution reduction recently returning of dolphins was reported in the coast of Bay of Bengal (Bangladesh) and canals, waterways, and ports of Venice (Italy) after a long decade.

Negative environmental effects of coved 19:

Covid 19 is global pandemic situation that's why daily & progressively the medical activities are increased which obviously increases medical waste. Mainly COVID-19 patients, diagnosis, treatment of huge number of patients, and disinfection purpose lots of infectious and biomedical wastes are generated from hospitals, labs etc. In Ahmedabad of India, the huge amount of medical waste generation is increased from 550-600 kg/day to around 1000 kg/day at the time of the first phase of shutdown. Similarly the cities like Manila, Kuala Lumpur, Hanoi, and Bangkok experienced similar rises, producing 154–280 m tonnes more medical waste per day than before the pandemic. Such a sudden rise of hazardous waste, and their proper management has become a significant challenge to the local waste management authorities. Therefore waste generated from the hospitals (e.g., needles, syringes, bandage, mask, gloves, used tissue, and discarded medicines etc.) should be managed properly, to lower the further infection and environmental pollution, which is now a matter of concern globally.

Also in United Kingdom, Italy, and other European countries also prohibited infected residents from sorting their waste . Hence Overall, due to disruption of routine municipal waste management, waste recovery and recycling activities, rises the landfilling and environmental pollutants worldwide. Recently, the tremendous amount of disinfectants is applied into roads, commercial, and residential areas to exterminate SARS-CoV-2 virus. Such as an extensive use of disinfectants may kill non-targeted beneficial species, which may create ecological imbalance.

Solution strategies for environmental sustainability:

Directly or indirectly, the pandemic is affecting human & living beings and the global economy, which is drastically affecting the environment and climate. It reminds us how we have neglected the environmental components and enforced human induced climate change. So the global response of COVID-19 also teaches us to work together to combat against the threat to mankind or humankind. Hence Though the impacts of COVID-19 on the environment are short-term, united and proposed time-oriented effort can sustainability and save the earth from the effects of global climate change.

Basically To meet the sustainable environmental goals and protection of global environmental resources, such as the global climate and biological diversity, combined international effort is essential. Hence, responsible international authority like United Nations Environment Programme (UN Environment) should take effective role to prepare time-oriented policies, arrange international conventions, and coordination of global leaders for proper implementation.also To decrease the carbon footprint and global carbon emission, it is necessary to change the behavior in our daily life and optimum consumption or resources like; avoid processed make compost from food waste, switch off or unplug electronic devices when not used, and use a bicycle instead of a car for shortdistances. Similarly for the ecological restoration, tourist spots should periodically lockdown after a certain period. So an ecotourism practice should be strengthened to promote sustainable livelihoods, cultural preservation, and biodiversity conservation. For the lowering the burden of wastes and environmental pollution, both industrial , domestic and municipal wastes should be recycled and reused. Hence, circular economy or circularity systems should implement in the production process to minimize the use of raw material and waste creation.

Simultaneously for the controlling an allenges of water pollution, both industrial , domestic and municipal wastewater should be properly treated before discharge. Since the reuse of treated wastewater in non-production processes like toilet flushing and road cleaning can reduce the burden of excess water withdrawal. To reduce emissions, it is must to encourage people to use public transport, rather private vehicles. So that the people should encourage to use bicycle in a short distance, and public bike sharing (PBS) system (like China) should be available for mass usage, which is not only eco-friendly but also beneficial for health. After a certain period, industrial zones should have been lock down in a circular way to reduce emission without hampering the national economy. So that industries especially readymade garments (RMG) and others where greater number of people work, proper distance and hygienic environment should maintain to reduce the spread of any of the an infectious communicable disease.

Space pollution:

We should appreciate curiosity of human about space but it is unfair that, the manmade activity are not stopped up to earth cause many of the man made activities like space exploration are created pollution in space. Hence this concept is included in modern pollution. The term space pollution have some some synonymous like Space debris , space junk, space pollutionspace waste, space trash, or space garbage etc. the first was launch of an artificial satellite Sputnik 1 into orbit in October 1957 hence Space debris began to accumulate in Earth orbit immediately with that.IN 1980s, NASA and other U.S. groups attempted to limit the growth of debris. One trial solution was implemented by McDonnell Douglas for the Delta launch vehicle so by having the booster move away from its payload and vent any propellant remaining in its tanks. This is eliminated one source for pressure build-up in the tanks which had previously caused them to explode and create additional to orbital debris. Normally in Other countries were slower to adopt this measure decade& cause of especially to a number of launches by the Soviet Union, the problem grew throughout the decade. Overall As long as humans have been exploring space, we've also been creating a bit of a mess there. An Orbiting our planet are thousands of dead satellites, along with bits of debris from all the rockets we've launched over the years. So This could pose an issue one day. Normallythere are about 2,000 active satellites orbiting Earth at the moment&there are also 3,000 dead ones littering space.So What's more, there are around 34,000 pieces of space junk bigger than 10 centimetres in size and millions of smaller pieces/splitter particles that could nonetheless prove disastrous if they hit something else.

This given information is maintained and updated through the DISCOS database (Database and Information System Characterising Objects in Space). So DISCOS is as a single-source reference for information on launch details info. orbit histories, physical properties and mission descriptions for about 38 700 objects tracked since Sputnik-1, including nearly 10 million orbit records in total. In US Space Surveillance Network provides a continuous flow of an orbit data for all tracked, unclassified objects.Today, DISCOS constitutes a recognised, reliable and dependable source of space object data that is regularly apply by almost 40 customers worldwide.

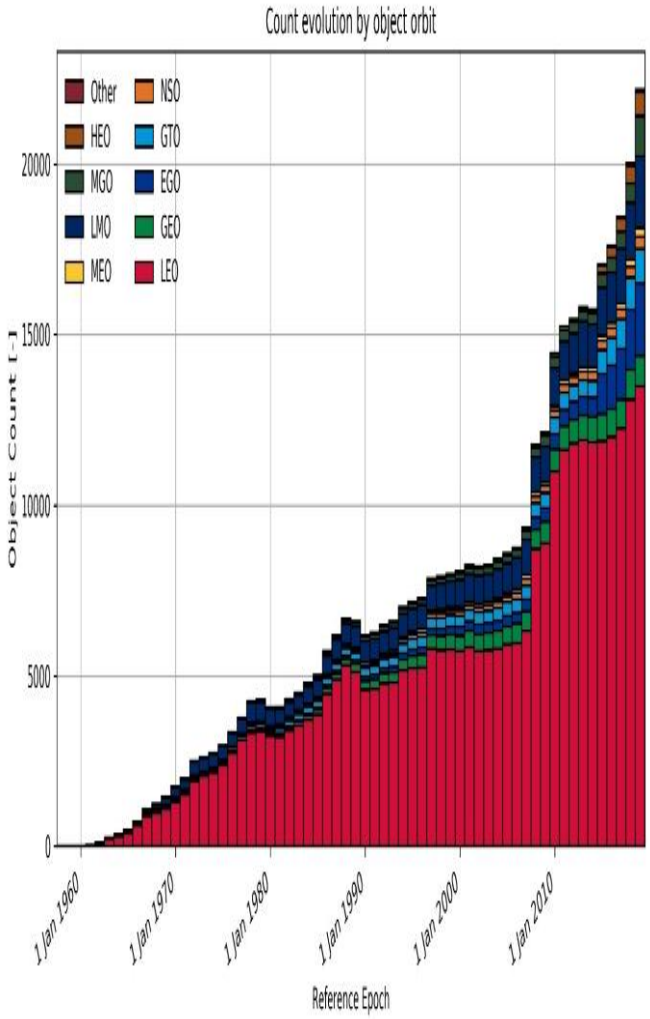


Figure no 3. Data base for space pollution

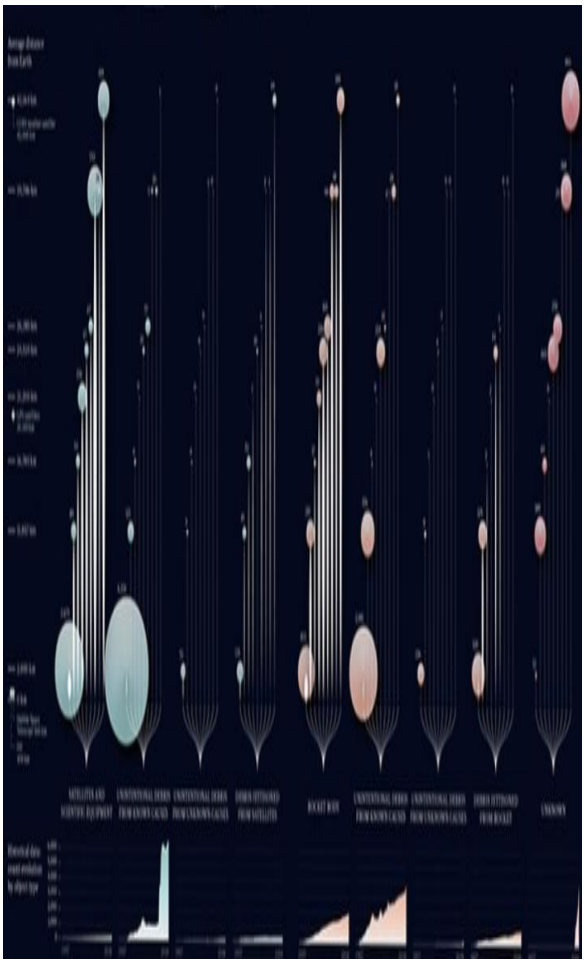


Figure no 4. Data visualization for space

Data visualization of space pollution:The given figure no 4 is showing the data visualization for space pollution. It is categorized as per their average distance from earth to object. The number of objects orbiting to earth & mass in tonnes are indicated.

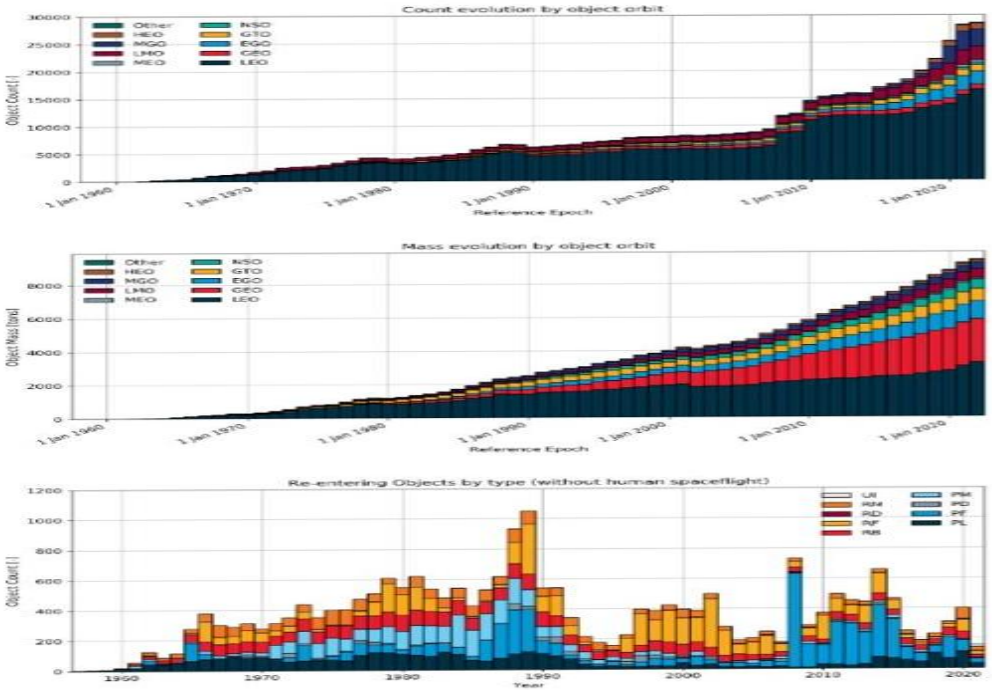


Figure no 5. Collective data analysis & visualization for space pollution

Table no 3

Current number of orbiting objects per type and orbital regime

Orbital Regime	PL	PF	PD	PM	RB	RF	RD	RM	UI	Total
LEO	5355	6423	130	234	895	2553	135	607	132	16464
GEO	768	3	2	3	66	1	0	0	28	871
EGO	463	1	0	51	188	90	1	3	1603	2400
GTO	62	12	1	11	243	192	11	59	562	1153
NSO	272	0	0	1	91	0	0	2	10	376
MEO	65	3	5	52	20	108	1	3	270	527
LMO	87	153	7	47	230	727	20	221	969	2461
MGO	69	70	1	2	176	2082	5	0	726	3131
HEO	28	14	0	1	46	88	0	1	924	1102
Other	35	0	0	4	3	0	0	0	83	125
Total	7204	6679	146	406	1958	5841	173	896	5307	28610

Table no 4

Current cumulative cross sectional area (m^2) in orbit per object type and orbital regime

Orbital Regime	PL	PF	PD	PM	RB	RF	RD	RM	UI	Total
LEO	28447.7	0.4	4.7	83.2	10567.2	2.6	0.0	274.4	8.9	39389.3
GEO	23742.7	0.0	23.6	6.5	1486.4	0.0	0.0	0.0	0.0	25259.2
EGO	9810.7	0.0	0.0	37.9	3837.5	0.0	0.0	0.6	0.0	13686.7
GTO	762.5	0.0	0.0	8.8	5868.3	0.0	0.0	835.6	0.0	7475.1
NSO	2519.4	0.0	0.0	0.8	1839.2	0.0	0.0	0.0	0.0	4359.4
MEO	915.5	0.0	0.0	10.3	275.8	0.0	0.0	15.3	0.0	1216.9
LMO	672.7	0.0	0.0	14.9	4433.5	0.0	0.0	1546.5	0.0	6667.5
MGO	934.7	0.0	0.0	14.5	3045.8	0.0	0.0	0.0	0.0	3994.9
HEO	571.8	0.0	0.0	0.1	1076.8	0.0	0.0	27.4	0.0	1676.2
Other	380.7	0.0	0.0	0.4	28.8	0.0	0.0	0.0	0.0	409.9
Total	68758.5	0.4	28.3	177.4	32459.2	2.6	0.0	2699.8	8.9	104135.1

As per figure no 5. Data presented hereafter will only related to catalogued objects, and hence next to the increase of the space object population by man made activity show the increase in availability of space surveillance networks. The occurrence that is Orbit Control Capacity will be used to identify Payload an objects which can alter their orbit by means of applying present impulsive or continuous thrust. This thus include all conventional types of space propulsion but not technologies exploiting natural perturbations as like drag or solar sails. Rocket bodies, also similar way the described Stages are all assumed to have OCC. Human spaceflight (HS) directly related missions are analysed separately, so they tend to skew results in terms of mass and count affected for the space environment and have generally a very high reliability. These mission include manned payloads as well as cargo payloads, but not the rocket bodies which bring them into orbit. An in-depth report will be definitely available here soon.

Plastic pollution:

In recent years mostly after 2005 , the amount of attention focused on very small plastic particles has increased pragmatically, but little is yet known about their long-term effects on the environment. The micro plastics The Ocean Clean up is focused on preventing is the so-called secondary micro plastics, that is plastic fragments resulting from the breakdown of larger plastic debris at land and sea.Cause plastic is such a persistent material, the ecological, economic and eco-toxicological effects of plastic pollution are all long-time. These include:

1. Physical impact on ocean life: entanglement, ingestion, starvation
2. Chemical impact: the build-up of persistent organic pollutants like PCBs and DDT
3. Transport or migration of an invasive species and pollutants from polluted rivers to remote areas in the ocean
4. Financial impact: damage to fisheries, shipping, and tourism

Data analysis of plastic pollution:

The figure no 6 is showing global plastic productiontonnes per year. The data available here is from 1950 to 2015. Therefore from given chart we can see that in 1950 very less amount of plastic getproduced but gradually The demand and the need of plastic increased So that in 2015 the plastic production is around 350 million tonnes And before that in 2010 the plastic production was 300 million tonnes

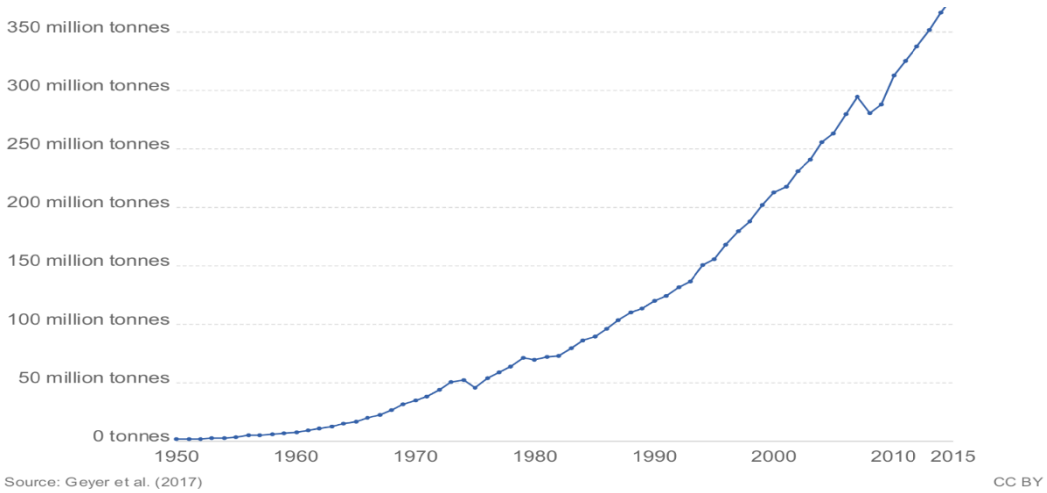


Figure no 6 global plastic production

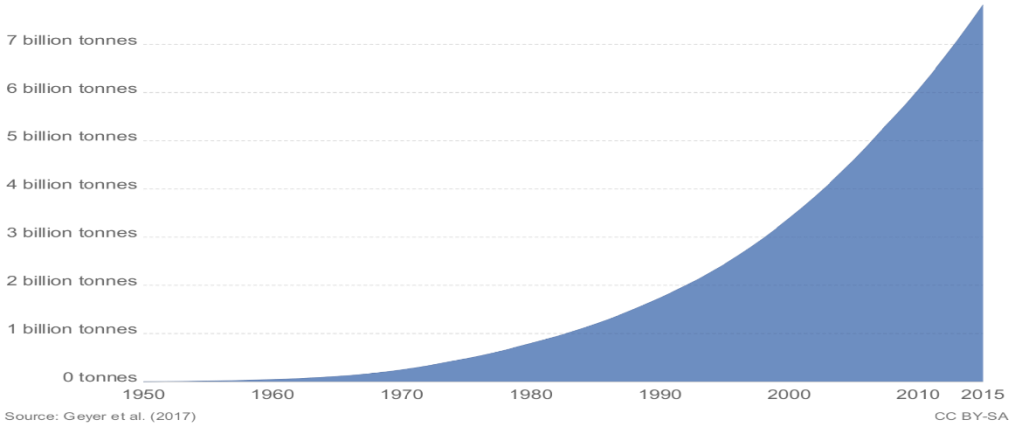


Figure no 7 cumulative plastic production

From thecumulative plastic production data that is figure no 7 we can analyse that how much plastic get produced cumulatively. So the highest level of production is in 2015 that is 7 billion tonnes & before that in 1950 it was too less that is 1 billiontonnes. The whole data of cumulative plastic production is given below from 1950 to 2015

Data sheet no. Global cumulative plastic production

Entity	Code	Year	Cumulative global plastics production (million tonnes)
World	OWID_WRL	1950	2000000
World	OWID_WRL	1951	4000000
World	OWID_WRL	1952	6000000
World	OWID_WRL	1953	9000000
World	OWID_WRL	1954	12000000
World	OWID_WRL	1955	16000000
World	OWID_WRL	1956	21000000
World	OWID_WRL	1957	26000000
World	OWID_WRL	1958	32000000
World	OWID_WRL	1959	39000000
World	OWID_WRL	1960	47000000

World	OWID_WRL	1961	56000000
World	OWID_WRL	1962	67000000
World	OWID_WRL	1963	80000000
World	OWID_WRL	1964	95000000
World	OWID_WRL	1965	112000000
World	OWID_WRL	1966	132000000
World	OWID_WRL	1967	155000000
World	OWID_WRL	1968	182000000
World	OWID_WRL	1969	214000000
World	OWID_WRL	1970	249000000
World	OWID_WRL	1971	287000000
World	OWID_WRL	1972	331000000
World	OWID_WRL	1973	382000000
World	OWID_WRL	1974	434000000
World	OWID_WRL	1975	480000000
World	OWID_WRL	1976	534000000
World	OWID_WRL	1977	593000000
World	OWID_WRL	1978	657000000
World	OWID_WRL	1979	728000000
World	OWID_WRL	1980	798000000
World	OWID_WRL	1981	870000000
World	OWID_WRL	1982	943000000
World	OWID_WRL	1983	1023000000
World	OWID_WRL	1984	1109000000
World	OWID_WRL	1985	1199000000
World	OWID_WRL	1986	1295000000
World	OWID_WRL	1987	1399000000
World	OWID_WRL	1988	1509000000
World	OWID_WRL	1989	1623000000
World	OWID_WRL	1990	1743000000
World	OWID_WRL	1991	1867000000
World	OWID_WRL	1992	1999000000
World	OWID_WRL	1993	2136000000
World	OWID_WRL	1994	2287000000
World	OWID_WRL	1995	2443000000
World	OWID_WRL	1996	2611000000
World	OWID_WRL	1997	2791000000
World	OWID_WRL	1998	2979000000
World	OWID_WRL	1999	3181000000
World	OWID_WRL	2000	3394000000
World	OWID_WRL	2001	3612000000

World	OWID_WRL	2002	3843000000
World	OWID_WRL	2003	4084000000
World	OWID_WRL	2004	4340000000
World	OWID_WRL	2005	4603000000
World	OWID_WRL	2006	4883000000
World	OWID_WRL	2007	5178000000
World	OWID_WRL	2008	5459000000
World	OWID_WRL	2009	5747000000
World	OWID_WRL	2010	6060000000
World	OWID_WRL	2011	6385000000
World	OWID_WRL	2012	6723000000
World	OWID_WRL	2013	7075000000
World	OWID_WRL	2014	7442000000
World	OWID_WRL	2015	7823000000

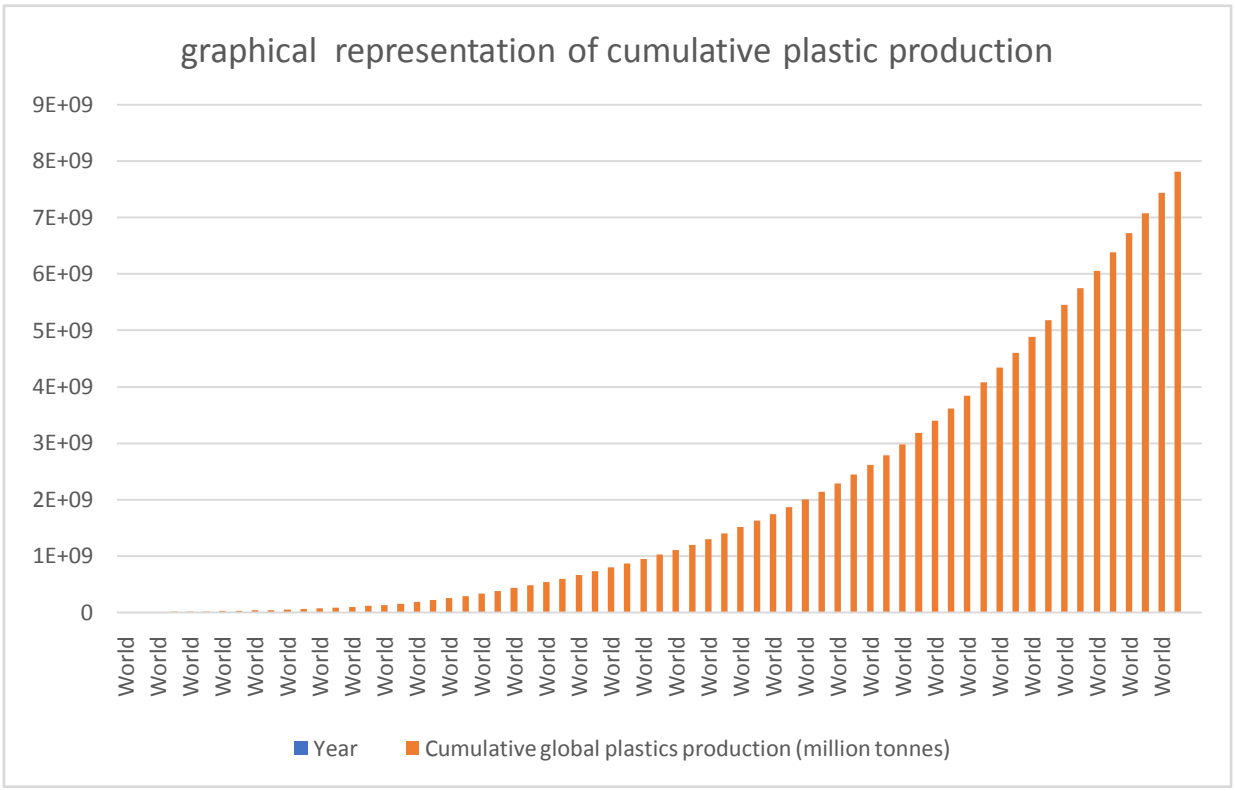


Figure no 8. Graphical representation of cumulative plastic production

Now which sectors are produces plastic is main factor in data analysis hence as per our survey we have got this data showing below in data sheet number 2 also the graphical representation is showing in figure no 9. This figure & data is shows the use of primary plastics by sector; in the figure show these same sectors in terms of plastic waste generation. Plastic waste generation is strongly influenced by primary plastic use, but also the product lifespan Packaging, for example, has a very short 'in-use' lifetime (typically around 6 months or less). This is in contrast to building and construction, where plastic use has a mean lifespan of 35 years.

Data sheet no 2. Sector wise plastic production

Entity		Year	Primary plastic production (million tonnes)
All industrial sectors		2015	407000000
Building and Construction		2015	65000000
Consumer & Institutional Products		2015	42000000
Electrical/Electronic		2015	18000000
HDPE		2015	52000000
Industrial Machinery		2015	3000000
LD, LDPE		2015	64000000
Other polymer type		2015	16000000
Other sectors		2015	47000000
PET		2015	33000000
PP		2015	68000000
PP&A fibres		2015	59000000
PS		2015	25000000
PUT		2015	27000000
PVC		2015	38000000
Packaging		2015	146000000
Textiles		2015	59000000
Transportation		2015	27000000

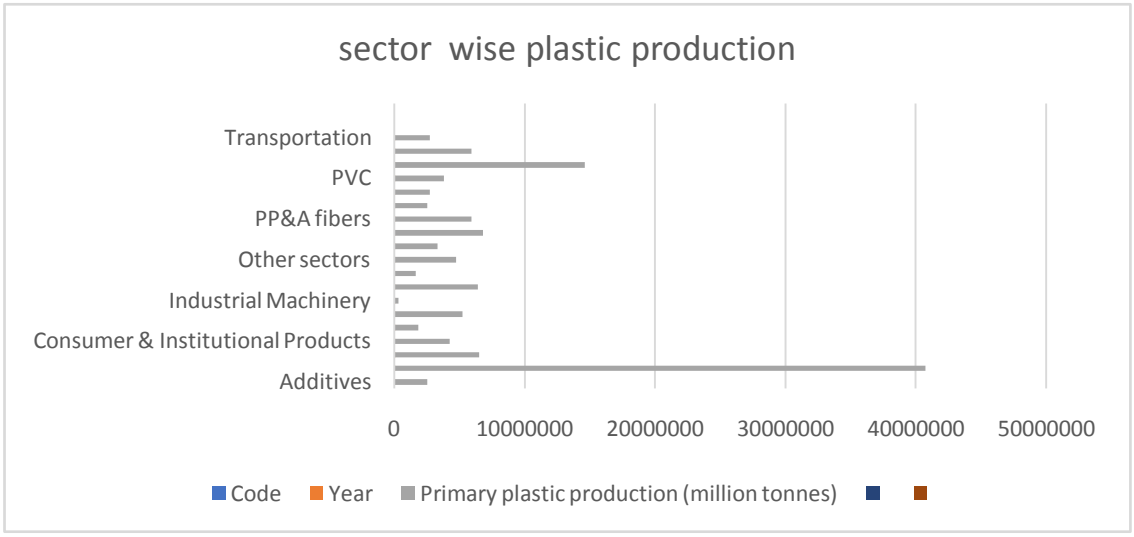


Figure no 9. Sector wise plastic production

However global production of plastic was 270 million tonnes per year. Alsoglobal plastic waste was 275 million tonnes – it did exceed annualprimary production through wastage of plastic from previous yearsandplastic waste generated in coastal areas is most at risk of entering the oceans; in 2010 coastal plastic waste – generated within 50 kilometres of the coastline – amounted to 99.5 million tonnes. So only plastic waste which is improperly managed is at significant risk of leakage to the environment; in 2010 this amounted to 31.9 million tonnes. Hence 8 million tonnes – 3% of global annual plastics waste – entered the ocean (through multiple outlets, including rivers). Similarly Plastics in the oceans' surface waters is several orders of magnitude lower than annual ocean plastic inputs. This discrepancy is known as the 'missing plastic problem' and is discussed now .The amount of

plastic in surface waters is not very well known: as an estimates range from 10,000s to 100,000s tonnes.

Now the global plastic waste disposal method changed over time? In the given data sheet number 3 see the share of global plastic waste that is discarded, recycled or incinerated from 1980 through to 2015. In 1980, recycling, reusing and incineration of plastic was negligible; 100 percent was therefore discarded. But From 1980 for incineration, and 1990 for recycling, rates increased on average by about 0.7 percent per year. Similarly In 2015, an estimated 55 percent of global plastic waste was discarded, 25 percent was incinerated, and 20 percent recycling is done. Suppose If we extrapolate historical trends through to 2050 — as can be seen in the as per the data by 2050, incineration rates would increase to 50 percent; recycling to 44 percent; and discarded waste would fall to 6 percent. However, note that this is based on the simplistic extrapolation of historic& traditional trends and does not demonstrate concrete projections.

Data sheet no.3 plastic history fate

Entity	Year	Estimated historic plastic fate
Discarded	1980	100
Discarded	1981	98.3
Discarded	1982	97.6
Discarded	1983	96.9
Discarded	1984	96.2
Discarded	1985	95.5
Discarded	1986	94.8
Discarded	1987	94.1
Discarded	1988	92.8
Discarded	1989	91.4
Discarded	1990	90
Discarded	1991	88.6
Discarded	1992	87.2
Discarded	1993	85.8
Discarded	1994	84.4
Discarded	1995	83
Discarded	1996	81.6
Discarded	1997	80.2
Discarded	1998	78.8
Discarded	1999	77.4
Discarded	2000	76
Discarded	2001	74.6
Discarded	2002	73.2
Discarded	2003	71.8
Discarded	2004	70.4
Discarded	2005	69
Discarded	2006	67.6
Discarded	2007	66.2
Discarded	2008	64.8
Discarded	2009	63.4
Discarded	2010	62
Discarded	2011	60.6
Discarded	2012	59.2

Discarded	2013	57.8
Discarded	2014	56.4
Discarded	2015	55
Incinerated	1980	0
Incinerated	1981	1.7
Incinerated	1982	2.4
Incinerated	1983	3.1
Incinerated	1984	3.8
Incinerated	1985	4.5
Incinerated	1986	5.2
Incinerated	1987	5.9
Incinerated	1988	6.6
Incinerated	1989	7.3
Incinerated	1990	8
Incinerated	1991	8.7
Incinerated	1992	9.4
Incinerated	1993	10.1
Incinerated	1994	10.8
Incinerated	1995	11.5
Incinerated	1996	12.2
Incinerated	1997	12.9
Incinerated	1998	13.6
Incinerated	1999	14.3
Incinerated	2000	15
Incinerated	2001	15.7
Incinerated	2002	16.4
Incinerated	2003	17.1
Incinerated	2004	17.8
Incinerated	2005	18.5
Incinerated	2006	19.2
Incinerated	2007	19.9
Incinerated	2008	20.6
Incinerated	2009	21.3
Incinerated	2010	22
Incinerated	2011	22.7
Incinerated	2012	23.4
Incinerated	2013	24.1
Incinerated	2014	24.8
Incinerated	2015	25.5
Recycled	1980	0
Recycled	1981	0

Recycled	1982	0
Recycled	1983	0
Recycled	1984	0
Recycled	1985	0
Recycled	1986	0
Recycled	1987	0
Recycled	1988	0.6
Recycled	1989	1.3
Recycled	1990	2
Recycled	1991	2.7
Recycled	1992	3.4
Recycled	1993	4.1
Recycled	1994	4.8
Recycled	1995	5.5
Recycled	1996	6.2
Recycled	1997	6.9
Recycled	1998	7.6
Recycled	1999	8.3
Recycled	2000	9
Recycled	2001	9.7
Recycled	2002	10.4
Recycled	2003	11.1
Recycled	2004	11.8
Recycled	2005	12.5
Recycled	2006	13.2
Recycled	2007	13.9
Recycled	2008	14.6
Recycled	2009	15.3
Recycled	2010	16
Recycled	2011	16.7
Recycled	2012	17.4
Recycled	2013	18.1
Recycled	2014	18.8
Recycled	2015	19.5

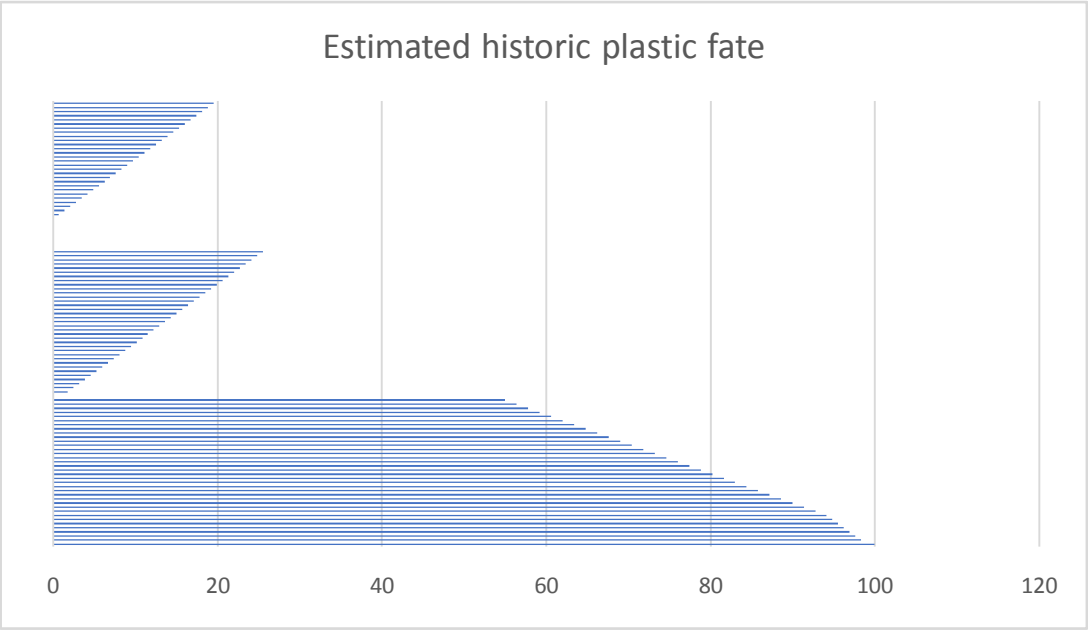


Figure no. 10 estimated plastic history fate

Solution strategies for plastic pollution:

Recycle, reuse &recovery is best solution forever for plastic pollution. That's why we can optimize plastic production & cost too. Also public awareness plays vital role always for society &environment protection. Hence people should be follow the government rules & norms regarding to that. Most it is necessary to encourage people to avoid plastic use like plastic bottles, bags, cans & so on. Buy bar soap instead of liquid. Buy in bulk. Avoid produce sheathed in plastic. And while you're at it, give up plastic plates and cups. The French are slightly banning the stuff nowadays. Also for the Help remove plastics from the ocean and prevent them from getting there in the first place by participating in. an organizing a clean-up of your local beach. This is one of the most direct and rewarding ways to fight ocean pollution. You can simply go to the beach or waterway and collect plastic waste on your own or with friends or family, or you can join a local organization's clean-up or an international event like the International Coastal Clean-up.

Marine pollution:

One of the biggest disadvantage of our oceans is human-made pollution. Discarded plastics and other residential waste, discharge from pesticides and industrial chemicals eventually find their way into the ocean or sea with devastating consequences for marine life and the habitats they depend on. Shipping accidents and oil spills add additional toxins to the mix. Many of the surveys proven that a staggering 80 per cent of marine pollution originates on land. Land-based pollutants – as like agricultural run-off and nutrients from sewage outflows are contributing to ocean 'dead zones' areas which have no longer sustain life because they have low or zero oxygen. There are now some 500 of these dead zones through out the world.

Data analysis of marine pollution:

The data of oil spills and other marine pollution events reported to Maritime Safety Queensland from 2019 to 2020 in data sheet no

Data sheet no 4

Region	Ship Type	Area	Pollutant	Estimated Litres
Brisbane	Recreational	Coastal Waters	Diesel	50L
Brisbane	Commercial	Coastal Waters	Garbage	Unknown
Brisbane	Commercial	Port Limits	Hydraulic Oil	Unknown
Cairns	Fishing	Port Limits	Bilge	50L
Gladstone	Fishing	Port Limits	Diesel	1200L
Cairns	Commercial	Port Limits	Diesel	2-3L
Cairns	Fishing	Port Limits	Diesel	1000L
Brisbane	Commercial	Port Limits	Other	< 20L

Cairns	Commercial	Port Limits	Diesel	10L
Gladstone		Port Limits	Diesel	100L
Gladstone	Unknown	Port Limits	Diesel	40-50L
Brisbane	Recreational	Coastal Waters	Diesel	< 5L
Gladstone	Tanker	Port Limits	Other	7-10 m2
Brisbane	Recreational	Coastal Waters	Diesel	50m x 5m
Cairns	Commercial	Coastal Waters	Other	6-8L
Gladstone	Unknown	Coastal Waters	Diesel	50m x 5m
Cairns	Trading Ship	Port Limits	Other	20mx 5m
Brisbane	Commercial	Coastal Waters	Other	0.5L
Gladstone	Recreational	Port Limits	Sheen	100m x 50m
Gladstone	Unknown	Coastal Waters	Other	3L
Mackay	Recreational	Coastal Waters	Diesel	32L
Brisbane	Unknown	Inland waters	Diesel	15m wide
Townsville	Unknown	Port Limits	Sheen	<5L
Brisbane	Commercial	Coastal Waters		algal bloom
Brisbane	Commercial	Coastal Waters	Diesel	3000m X 2000m
Townsville		Port Limits	Other	100ml
Brisbane	Unknown	Inland waters	Sheen	<5L
Cairns	Commercial	Coastal Waters	Other	1300L
Cairns	Recreational	Port Limits	Sheen	100m x 50m
Brisbane	Unknown	Coastal Waters	Other	10m x 2nm
Townsville	Unknown	Port Limits	Diesel	50m x 30m
Brisbane	Recreational	Coastal Waters	Diesel	1m x 10M
Townsville	Unknown	Coastal Waters	Sheen	Unknown
Brisbane	Unknown	Coastal Waters	Other	algal bloom
Brisbane		Port Limits	Other	200+L
Gladstone	Commercial	Port Limits	Other	500m X 50M
Gladstone	Recreational	Port Limits	Diesel	10 litres
Mackay	Commercial	Port Limits	Other	
Cairns	Commercial	Port Limits	Other	30L
Brisbane	Recreational	Port Limits	Other	none
Cairns		Port Limits	Diesel	1L
Brisbane	Recreational	Port Limits	Diesel	1500L
Cairns	Unknown	Port Limits	Other	oily rags
Brisbane	Recreational	Inland waters	Diesel	600m x 60m
Townsville	Unknown	Port Limits	Diesel	unknown
Mackay	Recreational	Port Limits	Other	1 cubic metre
Cairns	Commercial	Port Limits	Bilge	3m x 50m
Brisbane	Unknown	Port Limits	Sheen	20m x 5m
Mackay		Port Limits	Other	40L

Cairns	Commercial	Port Limits	Diesel	2L
Brisbane	Unknown	Coastal Waters	Diesel	Unknown
Brisbane	Unknown	Coastal Waters	Other	300 L
Gladstone	Unknown	Port Limits	Sheen	100m x 75m
Brisbane	Recreational	Inland waters	Sheen	2m x 10m
Brisbane	Unknown	Port Limits	Sheen	200 x 20m
Cairns	Recreational	Port Limits	Sheen	10l
Brisbane	Commercial	Port Limits	Sheen	50m x 15m
Brisbane	Commercial	Port Limits	Bilge	150m x 2M
Mackay	Commercial	Port Limits	Diesel	1L
Gladstone	Recreational	Inland waters	Sheen	Unknown
Brisbane	Unknown	Coastal Waters	Other	Unknown
Gladstone	Commercial	Coastal Waters	Other	unknown
Brisbane	Unknown	Port Limits	Sheen	30mx 10m
Cairns	Unknown	Port Limits	Diesel	50m wide
Gladstone	Commercial	Port Limits	Hydraulic Oil	<2 litres
Brisbane	Recreational	Inland waters	Diesel	30m X 2 M
Gladstone	Recreational	Port Limits	Diesel	1 litre
Cairns	Fishing	Coastal Waters	Diesel	80 litres
Brisbane	Commercial	Port Limits	Hydraulic Oil	0.5 litres
Cairns	Fishing	Port Limits	Diesel	10 X 10 M
Brisbane	Fishing	Inland waters	Other	150x5m
Gladstone	Recreational	Inland waters	Other	nil
Gladstone	Commercial	Inland waters	Hydraulic Oil	10 litres
Brisbane	Commercial	Port Limits	Diesel	50m X 20m
Gladstone	Trading Ship	Port Limits	Hydraulic Oil	500ml to 1 litre
Brisbane	Commercial	Port Limits	Bilge	2-6 litres
Gladstone	Unknown	Port Limits	Bilge	1 litre
Gladstone	Unknown	Port Limits	Diesel	100m x 2 m
Brisbane	Commercial	Port Limits	Diesel	200 litres
Gladstone	Unknown	Port Limits	Bilge	1/2 litre
Brisbane	Commercial	Port Limits	Other	20 to 30 litres
Brisbane	Commercial	Inland waters	Diesel	<5 litres
Gladstone	Unknown	Coastal Waters	unknown	1nm wide & long
Cairns	Recreational	Coastal Waters	unknown	75 Litres
Gladstone	Recreational	Port Limits	Other	<90 litres
Townsville	Commercial	Port Limits	Sewage	> 100 Litres
Brisbane	Commercial	Port Limits	Hydraulic Oil	100- 200ml
Cairns	Unknown	Port Limits	Diesel	3-5 litres
Cairns	Recreational	Port Limits	Diesel	2-3 litres

Oil spills:

From past four and half decades the time for which we have data – oil spills from tankers decreased very substantially.The dataset by the International Tanker Owners Pollution Federation (ITOPF) recovers more than four decades over which time the incidence of large oil spills from tankers greatly decreased. So while in the 1970s there were 24.5 large (> 700 tonnes) oil spills per yearhence in the 2010s the average number of large oil spills decreased to 1.7 oil spills per year. So that both, large oil spills and medium sized oil spills (7-700 tonnes) are decreasing. This happened as the worldwide trade of petroleum and gas products increased. Included in the trade statistics is the trade of LNG, LPG, naphtha, methanol, gasoline, jet fuel, kerosene, light oil, heavy fuel oil and other petroleum products. The change in seaborne oil trade can be inferred from the following figure. Since the mid-1980s, seaborne oil trade is increasing while the number of oil spills is decreasing. Therefore this makes clear that the decrease in oil spills is not due to a decrease in oil trade. On the contrary the share of oil that is not reaching its destination yet it is falling very strongly and is small today.

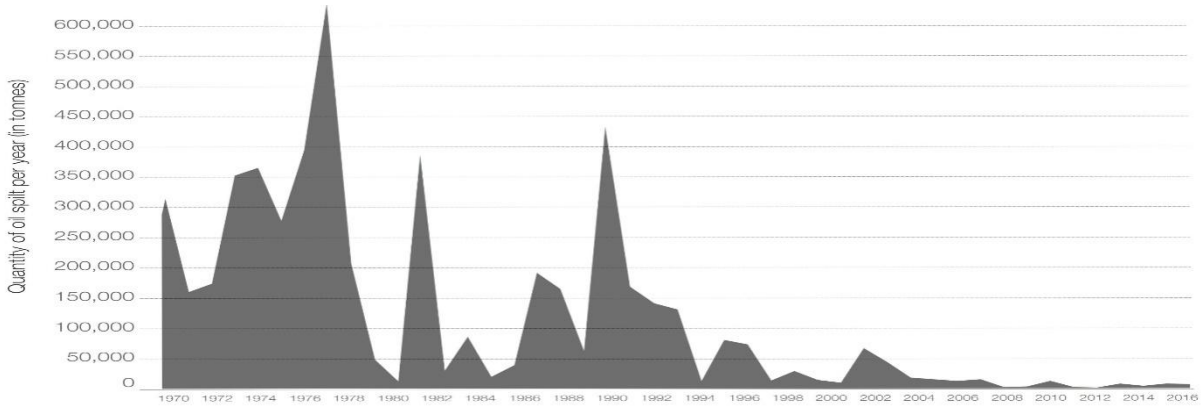


Figure no. 11 oil spills

Result & discussion:

Global production of plastic was 270 million tonnes per year. Also global plastic waste was 275 million tonnes – it did exceed annual primary production through wastage of plastic from previous years and plastic waste generated in coastal areas is most at risk of entering the oceans; in 2010 coastal plastic waste – generated within 50 kilometres of the coastline – amounted to 99.5 million tonnes. So only plastic waste which is improperly managed is at significant risk of leakage to the environment; in 2010 this amounted to 31.9 million tonnes. Hence 8 million tonnes – 3% of global annual plastics waste – entered the ocean (through multiple outlets, including rivers). Similarly Plastics in the oceans' surface waters is several orders of magnitude lower than annual ocean plastic inputs. This discrepancy is known as the 'missing plastic problem' and is discussed now .The amount of plastic in surface waters is not very well known: as an estimates range from 10,000s to 100,000s tonnes.The global plastic waste disposal method changed over time? In the given data sheet number 3 see the share of global plastic waste that is discarded, recycled or incinerated from 1980 through to 2015. In 1980, recycling, reusing and incineration of plastic was negligible; 100 percent was therefore discarded. But From 1980 for incineration, and 1990 for recycling, rates increased on average by about 0.7 percent per year. Similarly In 2015, an estimated 55 percent of global plastic waste was discarded, 25 percent was incinerated, and 20 percent recycling is done. Suppose If we extrapolate historical trends through to 2050 — as can be seen in the as per the data by 2050, incineration rates would increase to 50 percent; recycling to 44 percent; and discarded waste would fall to 6 percent. However, note that this is based on the simplistic extrapolation of historic & traditional trends and does not demonstrate concrete projections. From figure no 6. The global plastic production tonnes per year. The data available here is from 1950 to 2015. Therefore from given chart we can see that in 1950 very less amount of plastic get produced but gradually The demand and the need of plastic increased So that in 2015 the plastic production is around 350 million tonnes And before that in 2010 the plastic production was 300 million tonnes

The DISCOS database (Database and Information System Characterising Objects in Space). So DISCOS is as a single-source reference for information on launch details info. Orbit histories, physical properties and mission descriptions for about 38 700 objects tracked since Sputnik-1, including nearly 10 million orbit records in total. In US Space Surveillance Network provides a continuous flow of an orbit data for all tracked, unclassified objects. Today, DISCOS constitutes a recognised, reliable and dependable source of space object data that is regularly apply by almost 40 customers worldwide.

During pandemic most of industries, transportation has stopped hence suddenly co2 & greenhouse gases emissions get reduced. If we compare with this time of last year, levels of air pollution in Ney York has reduced by nearly 50%. Also nearly 50% reduction of N2O and CO occurred due to the shutdown of heavy industries in China & japan. Similarly the emission of NO_2 is one of the key indicators of global economic activities, which indicates a sign of reduction in many countries (e.g., US, Canada, China, India, Italy, Brazil etc.) Cause of recent lock down. According to UK based climate science and policy website mainly the recent crisis of COVID-19 reduces 25% CO2 emission in China, Japan and nonetheless below the normal limit more than two months after the country entered lockdown. They also presented that, the pandemic could reduce 1,600 metric tons of CO2, equivalent to above 4% of the global total in 2019.

Coved 19 is global pandemic situation that's why daily & progressively the medical activities are increased which obviously increases medical waste. Mainly COVID-19 patients, diagnosis, treatment of huge number of patients, and disinfection purpose lots of infectious and biomedical wastes are

generated from hospitals, labs etc. In Ahmedabad of India, the huge amount of medical waste generation is increased from 550-600 kg/day to around 1000 kg/day at the time of the first phase of shutdown. Similarly the cities like Manila, Kuala Lumpur, Hanoi, and Bangkok experienced similar rises, producing 154–280 m tonnes more medical waste per day than before the pandemic. Such a sudden rise of hazardous waste, and their proper management has become a significant challenge to the local waste management authorities. Therefore waste generated from the hospitals (e.g., needles, syringes, bandage, mask, gloves, used tissue, and discarded medicines etc.) should be managed properly, to lower the further infection and environmental pollution, which is now a matter of concern globally.

Also in United Kingdom, Italy, and other European countries also prohibited infected residents from sorting their waste. Hence overall, due to disruption of routine municipal waste management, waste recovery and recycling activities, rises the landfilling and environmental pollutants worldwide. Recently, the tremendous amount of disinfectants is applied into roads, commercial, and residential areas to exterminate SARS-CoV-2 virus. Such as an extensive use of disinfectants may kill non-targeted beneficial species, which may create ecological imbalance.

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