

VASUDHA



An Annual Publication of the
Department of Geography
Shri Shikshayatan College, Kolkata
December, 2023
Volume No. 15

VASUDHA

**An Annual Publication of the
Department of Geography
December 2023
Volume No. 15**



**SHRI SHIKSHAYATAN COLLEGE
KOLKATA**

VASUDHA
Volume - 15
December 2023

Editorial Board 2023 :

Faculty :

Dr. Susmita Sen

Dr. Jayati Das

Smt. Ritubarna Pratihar

Student Representatives :

Sakshi Rai, *Class of 2024*

Vareeja Ratna, *Class of 2025*

Cover :

Patachitra Art Paintings of
Naya Village, Paschim Medinipur, West Bengal

Cover Design :

Dr. Susmita Sen

Published by :

Department of Geography

Shri Shikshayatan College

11, Lord Sinha Road

Kolkata - 700 071

Phone : 2282-6033 / 2282-7296

Printed by :

PRATIRUP

35, Nandana Park

Kolkata - 700 034

Mobile : 9432301777, 9432114948

FROM THE EDITORIAL DESK !!

The Journal of the Geography Department is an annual publication that aims to foster creativity and academic research among students while providing a platform to showcase their efforts. The magazine recognizes the unique talents of every student and encourages a blend of perspectives. Its goal is to showcase the creative talents of students and provide a platform to exhibit their interests in various topics. This edition captures the year's activities and is a testament to our resolve and commitment.



CONTENTS

Page

INVITED PAPER :

- **WASTE TO WEALTH : LESSONS FOR MEGACITIES IN INDIA** 1
Dr. Chandani Bhattacharjee,
Professor & Head, Dept. of ENV, HSNC University, Mumbai, bhattacharjee.chandani@hrcollege.edu

FACULTY SECTION :

- **OPEN GREEN SPACES : A CASE STUDY OF KOLKATA** 6
Sreeya Bhattacharyya, *Faculty, Department of Geography, Shri Shikshayatan College, Kolkata*

ALUMNI SECTION :

- **AIR POLLUTION IN KOLKATA** 12
Dr. Aditi Kundu, *Research Manager, Environment Conservation Society, Kolkata*

STUDENTS' SECTION :

- **AMAZON RAINFOREST : DYING OR THRIVING**, Vareeja Ratna, *Class of 2025* 16
- **IMPACT OF COVID 19 ON HEALTH, EDUCATION, AGRICULTURE AND TOURISM IN WEST BENGAL** 20
Ushmita Mandal, Moitreyee Baidya, Jayashree Saha, Anusree Naskar, Srijita Samadder, Debolina Hazra, Neha Adhikari, Aindrila Talukder, Sambritta Barua, Oishee Jana, Insha Shahid, *Class of 2023*
- **RURAL DEVELOPMENT IN INDIA**, *Class of 2025* 30
- **A SMALL CHANGE CAN LEAD TO BIG ENVIRONMENTAL IMPACT** 37
Riyanka Banerjee, *Class of 2025*
- **SUNDARBAN – A RAMSAR SITE**, Riyanka Saha, *Class of 2025* 38
- **HEATWAVE IMPACT SCORCHING SECTORS AND MELTING ECONOMIC GROWTH IN INDIA** 40
Shreja Saha, *Class of 2025*
- **EXPLORING THE VIBRANT WORLD OF MULLICK BAZAR FLOWER MARKET** 42
Moutuli Das, *Class of 2024*
- **THE 'CLEANEST' SECRET OF MEGHALAYA!** 44
Riyanka Saha, *Class of 2025*
- **UNDERSTANDING THE URBAN HEAT ISLAND EFFECT : A GROWING CHALLENGE FOR CITIES** 47
Moutuli Das, *Class of 2024*
- **THE ESPLANADE MARKET, KOLKATA – A SAGA OF DESIRABILITY WITH AFFORDABILITY** 49
Ishani Roy, *Class of 2024*
- **NOIDA – THE EMERGING SILICON VALLEY OF NORTH INDIA** 52
Sakshi Rai, *Class of 2024*
- **WRAPPED WOES : NAVIGATING THE PITFALLS OF PROCESSED AND PACKAGED FOODS** 55
Abantika Roy, *Class of 2025*
- **UNLOCKING THE MYSTERIES OF THE GEOLOGICAL WONDERS OF LADAKH** 57
Aditi Majhi, *Class of 2025*

DEPARTMENTAL TOUR AND ACTIVITIES :

- **IN NAYA MAUZA, PASCHIM MEDINIPUR, WEST BENGAL, THE NATURAL SETTING INFLUENCES THE SOCIO-ECONOMIC LIFE OF PEOPLE** 61
Class of 2024
- **PHOTO ALBUM OF DEPARTMENTAL ACTIVITIES** 68

WASTE TO WEALTH : LESSONS FOR MEGACITIES IN INDIA

Dr. Chandani Bhattacharjee

Professor & Head, Dept. of ENV, HSNV University, Mumbai

bhattacharjee.chandani@hrcollege.edu

Abstract

Municipal solid trash has been increasing dramatically over the globe, especially in emerging countries. India is no different, with cities becoming more shaken by rising populations and a lack of trash disposal space. Waste volumes must be handled in a sustainable and efficient way, which includes segregation, recycling, and scientific waste disposal. However, in the process of waste reduction after segregation, garbage may be turned into resources, allowing for faster dissemination of MSW and increased benefits to households. The life cycle study of MSW would aid in the optimum use of the goods produced. The goal of this research was to find resources that can be generated from wastes and enable the megacities to create waste from wealth.

Keywords : *waste to wealth, MSW, megacities, LCA*

Introduction

Municipal Solid waste is now one of the most important fields of study and analysis owing to its increasing amount and difficulty to be managed sustainably. Though the garbage does not have to be urban or rural, the volume and implications of waste accumulations, as well as the issues that arise from them, have made it vital for any urban development. The Maharashtra Pollution Control Board defines waste as "solid wastes are those undesirable, useless, and unwanted materials and substances that arise from animal and human activities". Solid waste may be categorized into numerous categories based on its source : a) Household garbage is typically classed as municipal waste; b) Industrial waste is hazardous waste; c) Biomedical or hospital waste is infectious waste; and d) Hazardous waste and e-waste. The amount of rubbish created has steadily increased as populations have grown in all of the country's metropolitan centres. This necessitates a planned waste management strategy that includes segregation, recovery, scientific disposal, burning of defined category trash, industrial waste treatment, and autoclaving.

Defining megacities

The 2011 Indian Census recognized and described megacities as "UAs/Cities, there are three very large UAs with more than 10 million persons in the country, known as Mega Cities." These are very big urban agglomerations that have grown into massive urban areas with significant administrative, environmental, and socio-cultural difficulties in the twenty-first century. According to the 2011 Census, just three cities have reached 10 million people : Mumbai, Delhi, and Kolkata, with Chennai and Bangalore following closely behind. Greater Mumbai UA has the greatest population (18.4 million), followed by Delhi UA (16.3 million) and Kolkata UA (14.1 million) (Census, 2011). Furthermore, the Census indicates that the rise in population of megacities has decreased during the recent decade. Greater Mumbai UA, which had a population growth rate of 30.47% between 1991 and 2001, saw a 12.05% increase between 2001 and 2011. Similarly, Delhi UA (from 52.24% to 26.69% in 2001-2011) and Kolkata UA (from 19.60% to 6.87% in 2001-2011) have also slowed. (Indian census, 2011).

The trash created in the three megacities shows that Delhi UA generates the most, followed by Mumbai and Kolkata UA. It is worth noting that urbanization trends reveal Delhi UA as the city with the largest growth, with a 41% increase in urban population since the previous census. (The McKinsey Global Institute). According to CPCB data, the state with the most hazardous waste polluted sites is Delhi (21 sites), followed by Maharashtra (10 sites) and West Bengal (8 sites). As a result, the long-term perspective of the waste picture reveals a bigger problem for New Delhi as a megacity with an increasing population, more polluted sites, and worse trash collection efficiency than other megacities. Kolkata having the least population pressure, lesser waste generated per day may remain a megacity which has the greatest potential to rework its waste management schedules for a sustainable management of waste. The cities of Mumbai and Delhi would need to reinvent newer innovative and quick measures to tackle the waste sustainably

Table 1 : Megacity View of Different Aspects¹

Mega City	2001	Urban Population in the Megacities, 2011	Area in sq. kms	Waste Quantity (TPD)	Waste generation kg/c/day	Waste Collection Efficiency %
Kolkata	4572876	14.1 million	187	2653	0.58	Na
Delhi	1,03,06,452	16.3 million	1483	5922	0.57	90
Greater Mumbai	1,19,78,450	18.4 million	437	5320	0.45	96.6

Table Source : Compiled from CPCB.2005, Census 2001 & 2011, MOEF.

The waste composition is varied for the three megacities as well. The chief material in the waste disposed is compostable which indicates that the potential to segregate, vermin compost and biomethane generation as a byproduct of the waste collection and disposal process. This also shows a potential to reduce the waste in the future by segregation and the dumping of waste in the dumpyards could also reduce. The presence of recyclable waste could make way for reuse and follow the cradle to grave approach for all products.

Table 2 : Composition of Waste in the Megacities²

Megacity	Compostable %	Recyclable%	C/N Ratio	HCV/Kcal/kg	Moisture %
Kolkata UA	50.56	11.48	31.81	1201	48
Delhi UA	54.42	15.52	34.87	1802	49
Mumbai UA	62.44	16.66	39.04	1786	54

Mumbai, the financial center, has a population of 16.37 million and a waste collection rate of 7025 metric tons per day. (BMC, 2012), but the Maharashtra Pollution Control Board's most recent annual report on solid waste management implementation (MPCB,2015-16:5) puts the figure at 8600

¹Table 1 Source : Compiled from Census,2001,2011,CPCB 2005,MoEF.

²Table 2 Source : CPCB 2005 and MoEF

MTD. Mumbai generates the most e garbage every year, at around 3 lakh tons. To make matters worse, Mumbai covers 437.71 square kilometers and has a high population density of around 46,000 people per square kilometer in the city district and 20,000 people per square kilometer (Mahadevia, 2005). According to the 2001 Census, the city has 48.5% of the area under BMC in slums, while industrial workers, popularly known as chawls, account for 8.3 million or 70% of the population. As a result, the issues of overpopulation and poor sanitation remain. Thus,

Table 3 : Compiled Data on Mumbai

Area	Garbage Generation MT/Day	Population Density Persons/Sq. Kms.	Physical Characteristics by Weight in %							
			Bio-degradable	Paper/Card-board	Plastics	Metals	Glass	Inert	Bio resistant	Others
Island City	3700	49,163	42.29	6.16	4.23	0.85	1.28	18.09	4.15	23
Western Suburbs	2500	24,605	39.52	6.61	5.47	1.42	3.48	23.46	11.07	20.04
Eastern Suburbs	1600	10,410	35.72	10.93	4.87	0.65	0.87	26.76	11.81	20.25
	7800	26,722								

The waste as identified by the respondents as to the waste dumped in their bins, were the following : Kitchen waste (households), Tins/Cans/Wrappers, Plastics, Metals and Paper. The households have been consistently earning from the waste generated and which may be a manner to motivate the people towards vermin composting along with the regular segregation followed. The resources that can be trapped from the waste bins and through segregation include :-

- Energy; Waste to Energy, in pits or as landfill gas
- Recyclables; products like cardboards, paper, leather, glass, metals, etc.
- Compost from the segregated wet waste at the domestic pits, corporative pits or municipality pits

Waste to Wealth

According to the Swachh Bharat Mission (Urban), 1.45 lakh tons of municipal solid waste (MSW) are created each day in urban India. Upto 67% of metropolitan regions collect MSW door-to-door. Only roughly 23% of total garbage produced is processed/treated (33,215 tons per day), with the remaining 72% being landfilled (1.22 lakh tons per day). In 2025, waste creation in India's metropolitan regions would reach 0.7 kilogram per person per day, which is four to six times greater than the last decade. According to the Ministry of Environment, Forest, and Climate Change, India presently creates 62 million tons of garbage (both recyclable and non-recyclable) every year, with an average annual growth rate of 4%. Solid garbage, plastic waste, and e-waste are the most common waste products. The process therefore has to be in managing and handling the waste in such a manner that we are able to reach the net zero possibility in waste.

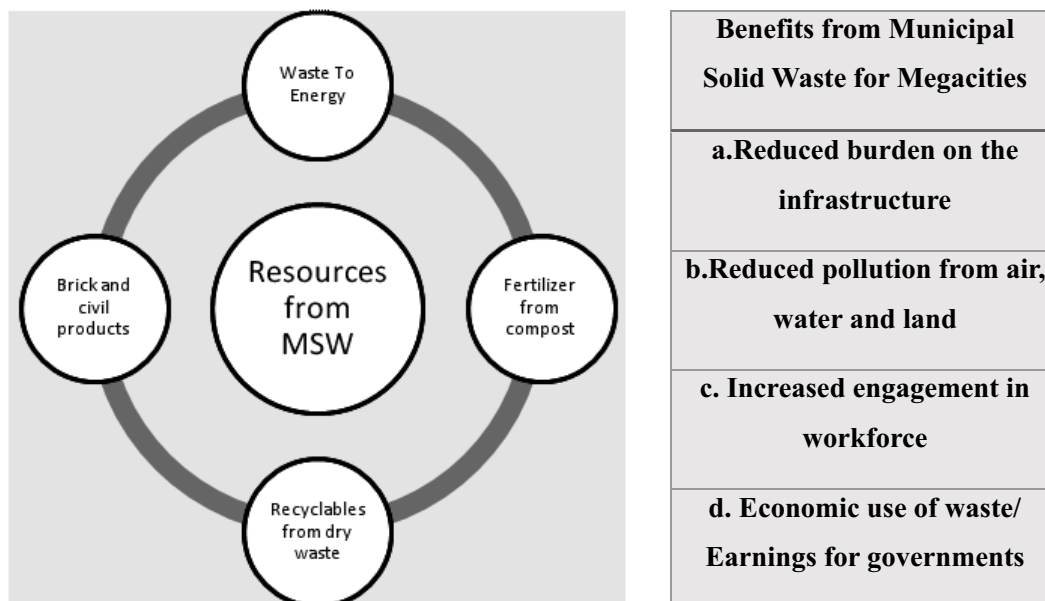


Figure 1 : Resources from Waste

From the governing point of view, and to promote and support the Swachh Bharat Unnat Bharat Abhiyan's aims, the Solid Waste Management (SWM) Rules 2016, Plastic Waste Management (PWM) Rules 2016, and E-waste (Management) Rules 2016 have been introduced in all urban and rural municipalities and corporations. The next big push has been made from the technology with the automated waste segregation, gasifiers, and pyrolysis units for generation of energy and reduction of collected waste. The waste management industry must adopt strategies that promote a circular economy. The cradle to grave approach has been effective for all countries who have adopted it. Also, creating a favourable regulatory environment and encouraging responsible behaviour, would encourage sustainable waste management in India. The use of developing technologies such as automated waste segregators, onsite waste processing such as composting/bio-methanation/ bio-CNG, gasifiers/pyrolysis, and so on has the potential to revolutionize India's existing waste management picture.

As studies have shown that over 50% of the collected waste is wet waste, segregation of the waste will ensure two- fold benefit. The wet waste can be treated as compost and reduce the cost of travel to the dumpsites dramatically. Additionally, the dry waste, based on the Plastic Handling Rules, 2016, has the potential to be handed to the recyclers for a benefit to the seller. This would create a pool of resources which may be sorted, segregated, re-sold and recoverable collected to be reused. This would reiterate the 3 Rs that have been in use for decades. This would also push the economy to become a zero-waste economy with the focus on circular economy.

Finally, the entire process would support the communities that depend and sustain on waste collection, segregation and handling of wastes, also called the rag pickers, the scavengers at the base of the pyramid and the recyclers at the apex.

Conclusion

The Ministry of Environment & Forest notified the Municipal Solid Wastes (Management and Handling) Rules in 2000. It made it mandatory for municipal authorities to set up waste processing and disposal facilities, identify sanitary landfill sites, and improve existing dumpsites. This was followed by

MSW Rules 2016, (Government of India, and MoEF& CC) on the 8th of April, 2016. The New Rules were more balanced and covered adequately the requirements of Solid Waste Management, including management of waste for every municipality in the country. The 2016, MSW Rules, have been effectively implemented in Mumbai, where segregation at source has become mandatory for households and commercial establishments. In Mumbai, for example this has reduced the waste generated per day from 9500 in 2015 MT/day to 6900 MT/day in 2019. Recycling has been encouraged and manufacturers have to bear some onus of the recycling as well. Conversion of landfill gas into energy, by setting up plants at Deonar Dumping Site or Refuse Dried Fuels which are pellets and can be used to burn for energy have been introduced. Composting has been instructed for buildings, facilities, over 5000sq meters. to help reduce the waste requiring transportation. All these measures have enabled that the waste generation in megacities like Mumbai has been dramatically reduced. Along with this initiatives like, Swaatch Bharat Abhiyan, Advanced Local Management Committees, Datak Vasti Yojna, Segregation, setting up of waste facilities, street sweepings, adequate transportation of the collected waste and finally attempting to reach the smaller and narrow lanes have shown some impact on the volumes generated per day. These measures have worked for one megacity of Mumbai. Hopefully the other megacities will work towards reducing their waste print and increase resources from it.

References

1. <https://www.mcgm.gov.in/irj/go/km/docs/documents/MCGM%20Department%20List/Solid%20Waste%20Management/Docs/SWM%20PPT%20Feb-2020.pdf>
2. Bhattacharjee C, (2012)Waste Management in Mumbai, Indian Society : Issues and Problems, Rewa.
3. Mahadevia D. et al., (2008), Solid Waste Management in Indian Cities : Status and Emerging Practices, Mumbai.
4. Penjor Y, 2007, Enhancing MSW Management with 3R options in Thimpu, AIT, Thimpu.
5. Recommendations For The Modernization of Solid Waste Management In Class I Cities In India (1999) : Report Of The Committee Constituted By The Hon'ble Supreme Court Of India (March, 1999).
6. Bigio Anthony G and Dahiya Bharat, (2004), Urban Environment and Infrastructure Towards Liveable Cities; The World bank, Washington D.C.
7. Bianchi Adraina, Cruz Wilfrido, and Nakamura Masahisa, (2005) *Local Approaches to Environmental Compliance, Japanese Case Studies and Lessons for Developing Countries*, The World Bank.
8. Chhokar Kiran B, Pandya Mamata and Raghunathan Meena, (2005), Understanding Environment, Sage Publications, New Delhi .
9. Dash M. C, (2004), *Ecology Chemistry and Management of Environmental Pollution*, Macmillan, New Delhi .
10. David, M.D, (1996), *Urban Explosion of Mumbai : Restructuring of Growth*, Himalaya Publishing House, Mumbai



OPEN GREEN SPACES : A CASE STUDY OF KOLKATA

Sreeya Bhattacharyya

Faculty, Department of Geography, Shri Shikshayatan College, Kolkata

ABSTRACT :

Open green spaces are areas present within the rural and urban environments that are categorized by abundant vegetation, such as parks, gardens, meadows, and forests. These spaces serve various ecological benefits which include trees absorbing pollutants and releasing oxygen, giving healthy urban environments, reducing surface temperature and preventing the creation of urban heat islands. They contribute to environmental sustainability by mitigating pollution and supporting biodiversity. It also has social benefits, economic benefits and planning benefits. In this paper, an attempt has been made to identify the existing status of green spaces, their importance, the reasons for their rapid shrinkage and the pathways which may be taken by the government to save such green spaces with a case study of Kolkata.

Keywords : Open green spaces, environmental sustainability, urban heat islands, biodiversity, shrinkage.

INTRODUCTION :

Open green space is an integral part of the modern planning of cities. It gained its importance during the 19th century. Due to increasing population, massive in-migration, land-use change, and industrial development there is a shrinkage of open green spaces within the city of Kolkata. Unplanned use as well as misuse of land use is leading to the conversion of useful land to wasteland. Land-use changes in a city are delicate issues because they affect the environment and its sustainability. Large open green spaces are often encroached on and converted to housing colonies leading to environmental degradation. The significance of open space is not only its extent but how it is arranged in the built environment.

Open green space within Kolkata has been declining due to the relentless trend of development. In this scenario, the city is headed towards an unbalanced system. For sustainability and balance of the system, planned open space and open green space systems are necessary. Since these spaces have not been considered potential revenue generators, these spaces are either neglected or not taken seriously by city administrators and planners.

STUDY AREA :

The metropolitan city of Kolkata (Fig. 1), the capital city of West Bengal presents a perfect picture of modern India along with traditional art and culture. This is located in the eastern part of India with an extent from 22°28'00" N and 22°37'30" N and 88°17'30" E and 88°25'00" E. Since the past three centuries, Kolkata has witnessed great development in all aspects, spreading linearly along the banks of river Hooghly. Kolkata spreads linearly along the banks of river Hooghly thus most of it is a part of the Indo-Gangetic Plain, the soil is predominantly alluvial. The physiography of the study area comprises the main three

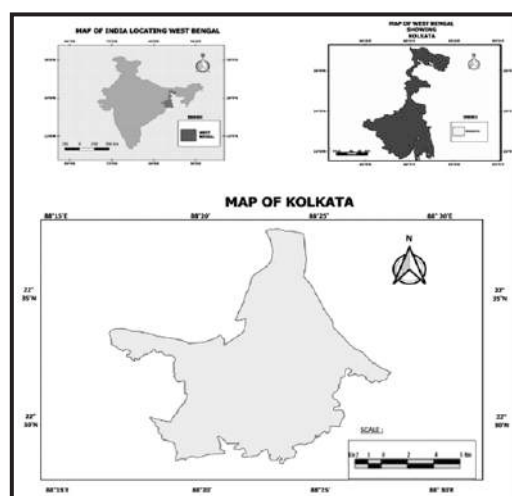


Fig. 1

structural units : the shelf in the west; the central hinge or slope break and the deep basin in the east and southeast.

STATUS OF KOLKATA'S OPEN GREEN SPACE :

According to the World Health Organization (WHO), at least 15% of the city's total area should be open spaces. The International minimum standard suggested by the World Health Organization and adopted by the publications of the United Nations Food and Agriculture Organization (FAO) is 9 square metres of green open space per city dweller in each city. However, most Indian metros fall below the mark including Kolkata. According to the reports of an NGO (Society for Environment and Development) Kolkata's open space has declined to 5.5% in 2013 (Fig. 2) from 13% in 2000.

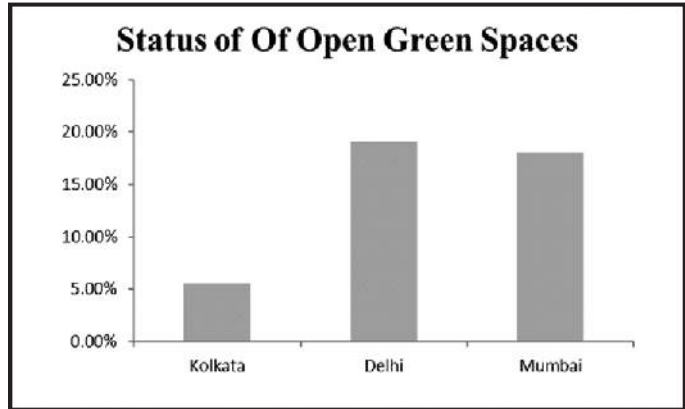


Fig. 2
Society for Environment and Development

SHRINKAGE OF OPEN GREEN SPACE IN KOLKATA FROM 1990-2018

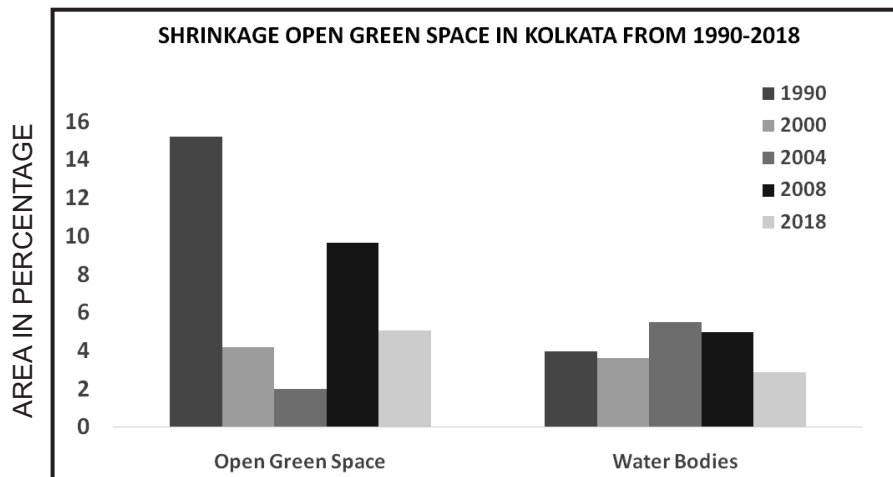


Fig. 3

In the year 1990, 15.23% of land was under parks and open spaces which became critically low in 2000 to 4.18% and lowest in 2004 to 1.95%. However, 2008 showed some promising results where parks and open spaces increased considerably to 9.64%. Again, in 2016 it is seen that open space has reduced to 0.68% while vegetation cover over Kolkata Municipal Corporation is 29.73%. It is seen that open green space in Kolkata is 5.024% (Fig 3). The percentage of water bodies has also shrunk from 4.96% in 2008 to 2.87% in 2018. Thus, in 28 years, 10.206% of open green space has shrunk. This is mainly due to the rapid urbanisation process, increasing built-up areas for industrial and commercial purposes and increasing residential areas to accommodate the ever-increasing population.

NDVI-BASED URBAN GREEN SPACE MAPPING :

An NDVI-based map(Fig. 4) was obtained which represents the degree of greenness of Kolkata. The eastern part of Kolkata has a very high value of > 0.6 indicating higher chlorophyll concentration than any other area on the map. It covers an area of 18.67Km². The southern portion of the Kolkata

region shows a relatively high NDVI value of 0.4-0.6 and most of the northern old CBD region has a low value of 0.2-0.4 indicating very unhealthy vegetation conditions which is mainly due to the rapid rate of urbanization and industrialization.

The map of Kolkata has been obtained from Kolkata Municipal Corporation (KMC). With the data collected from the Parks and Squares Department of KMC, a choropleth map of Kolkata showing the number of parks in each ward of the city has been prepared with the help of QGIS 3.6.2. It is clearly understood from the prepared map that ward no. 105, 109, 111, 116, 125, and 129 have the highest number (15-20) of parks which indicates these areas have relatively balance decology and healthy atmosphere. They are placed mostly in the rural-urban fringe zone due to which there are fewer commercial or industrial activities here. Ward no. 2, 5, 95, 98,103, 104,

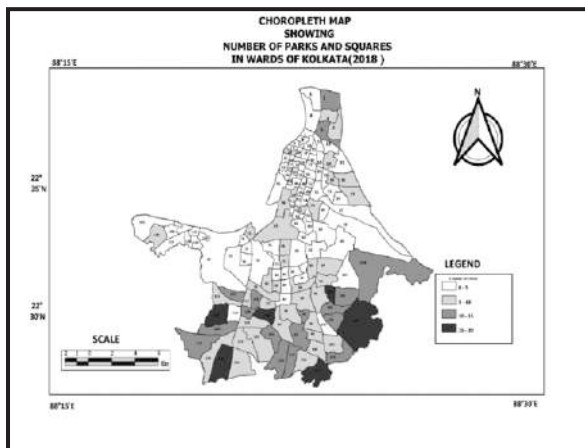


Fig. 5

Source: Prepared in QGIS 3.6.2

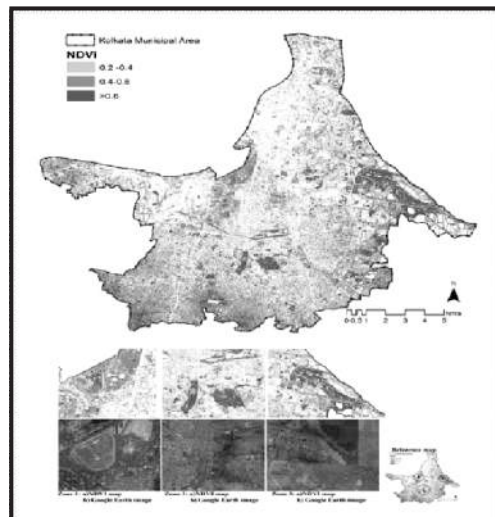


Fig 4

SOURCE : Modelling Earth System and Environment, (Bardhan et al, 2016)

106,113, 114, 115, 118, 120, 127, 128,132 have moderately high (10-15) number of parks. Ward no.3, 4, 14, 20,30 31, 33, 46, 47, 53, 55, 63, 67, 68,70, 72, 81, 82, 86, 88, 91,92, 93, 94, 96, 97,99, 100, 101, 112, 121, 122, 123, 124, 126, 131, 140 have moderately low (5-10) number of parks. The rest of the wards have the lowest (0-5) number of parks in the whole of Kolkata (Fig 5), they are mostly found in the old CBD areas which are the most congested and busiest areas of Kolkata and at the same time the most polluted parts of the city, thus, maximum attention should be given to these areas.

REASONS FOR SHRINKAGE OF GREEN SPACES IN KOLKATA :

1. **POPULATION INCREASE :** Delhi, which presently houses 22.7 million residents, is the world's second most populous urban agglomeration, while Mumbai and Kolkata which rank 7th and 10th accommodate 19.7 million and 14.4 million residents, respectively. Bangalore, Chennai, and Hyderabad are expected to exceed the 10 million population threshold by 2025 (UN-DESA 2012). The emergence of urban clusters and their expansion consumes significant proportions of agricultural land and substantially impacts biological diversity. The increase in population has adversely affected the green cover in urban India – Chennai and Mumbai have a meagre 0.46 m² (Srivathsan 2013) and 0.12 m² (FAO 1998) of green space per capita, respectively, as compared to the UN recommended standard of 9 m² of green space per capita.
2. **UNPLANNED GROWTH OF THE CITY :** Due to this increase in population there is a great deal of pressure on land availability. People need places to live and thus large-scale green spaces are cleared out for residential purposes. As a mega city, Kolkata faces a great deal of immigration from other smaller towns and cities due to its large employment capacity in the commercial sector, educational facilities, medical facilities etc. Due to this, there is a large-scale unplanned construction of houses, growth of slums, and illegal land encroachment.

3. **FLYOVER and METRO CONSTRUCTIONS IN KOLKATA** The city's 'green loss' has been enhanced by another project aimed at traffic ease, which involves the construction of flyovers and metro lines in Kolkata. This construction demands various roads to be widened and because of this, trees from many areas have been uprooted in recent years.
4. **BEAUTIFICATION OF PARKS** : The rush to beautify open spaces wherever they still exist is robbing Kolkata of its last remaining playgrounds. The number of parks with fountains and concrete walkways has increased over the past few years even as options are disappearing for children wanting to play a game of cricket or football or sprint across a ground. A recent study by the Calcutta-based Centre for Contemporary Communication has revealed that community halls, community toilets and apartment buildings have sprung up on what were once parks or playgrounds.
5. **LACK OF A MASTER PLAN** : Kolkata is the only metropolitan city that does not have a master plan (also called a development plan). All other metros have such plans, which contain detailed guidelines on how much open and green space will be there and how to maintain them. Environment activists are worried about the continuous assault on green space, which constitutes merely two per cent of the city's area. Ideally, around 10 per cent of a city's area must remain open. The absence of a master plan abets the assault.

CONSEQUENCES :

Due to the shrinkage of open green spaces, there are some heavy consequences that the city has to face. It is getting heated up so much so that heat islands are being created which causes temperatures to shoot up several degrees higher than the countryside. This is making life in the city difficult and uncomfortable, creating health hazards like heat stroke, exhaustion, fatigue, and cardiovascular and respiratory diseases among the citizens. Again, due to such shrinkage of green spaces, there is increased pollution making the quality of air hazardous to health leading to different types of cancers, lung infections etc. Shrinkage of open green spaces is giving way to concrete jungles which is indirectly affecting the groundwater level as water cannot seep through cemented grounds and is creating a severe drinking water crisis.

GOVERNMENT INITIATIVES FOR OPEN GREEN SPACES :

1. **ATAL MISSION FOR REJUVINATION AND URBAN TRANSFORMATION (AMRUT) SCHEME** : It is an action plan for the development of green space and parks and to progressively increase green cover in cities to 15% in 5 years in a reform milestone. The first phase of the AMRUT scheme was approved for eight schemes where a fund of 4.83 crore has been allotted to the Parks And Square Department of Kolkata Municipal Corporation.
2. **GREEN CITY CLEAN CITY SCHEME** : Inspired by the chief minister's vision of promoting the 'Green City Clean City' scheme, the Department of Municipal Affairs of State has taken several steps to develop green spaces in urban. It plans to cover around 470 acres of new green space in urban areas. Since 2011, the Department of Municipal Affairs of the state has developed 566 parks.
3. **GREEN CITY MISSION** : Under this initiative, the clean city drive-like road median works in various places of Bidhannagar, Howrah and other urban local bodies and urban areas along the EM Bypass have taken place. Developing parks and LED lighting, high mast illumination lights, and conservation and beautification of water bodies are its other objectives.

4. **COMPREHENSIVE URBAN FORESTRY PLAN** : The West Bengal Government agency, Housing Infrastructure Corporation (HIDCO), has decided to create, in collaboration with a private organisation the country's first urban forest in Kolkata. This will form an effective effort to combat pollution in the city. The urban forest, which will be spread over 4 acres of land, will come up in Rajarhat, on the outskirts of the city. At least 8,500 trees will be planted in this man-made urban forest, which will produce 9,54,500 kg of oxygen and absorb 5,27,000 kg of carbon dioxide.

CONCLUSION :

Open green space is an integral part of a city. It maintains the ecological balance in a densely populated and urbanised city. They have ecological benefits by maintaining a healthy urban environment absorbs pollution, releases oxygen and counteracts the urban heat island effect. They have social benefits such as helping in one's mental, physical and social development and economic importance by providing lumber, increasing the values of property etc. Thus, it is very important to include open green spaces in the planning structure of a mega city like Kolkata. Kolkata is becoming congested and cramped up due to the increasing population pressure, and immigration from surrounding less developed areas every year due to which there is increasing pressure on the available open spaces and green spaces which are being converted into residential areas. This in turn disrupts the balance that a city should maintain for the wellbeing of its inhabitants.

The West Bengal Government has taken great initiatives over the past few years. It has introduced the Green City Mission, Clean City Green City Schemes, and even proposed plans for urban forestry. Though such schemes and initiatives are commendable, it is not enough. There should be direct participation of people, more land should be allotted to urban green spaces, and there should be a proper master plan which can truly be a solution to this problem. The Government should make more such schemes and along with that people should act as more responsible citizens and plant more trees, discourage unnecessary uprooting of trees and make Kolkata a green and better city.

BIBLIOGRAPHY :

JOURNALS AND ARTICLES :

1. Jim, C. Y., & W. Y. Chen (2008), "Assessing the ecosystem services of air pollutant removal by Urban trees in Guangzhou". *Journal of Environmental Management*, 88(4) : 665-676
2. Jafri, M.S. & A.M. Rajaullah (2018), "Evaluating the Urban Green Spaces: Benefits and Issues." : *International Journal of Engineering Research*, Volume No.7: 269-273
3. Bardhan, R. et al, (2016), "A conceptual model for identifying the risk susceptibility of urban green spaces using geo-spatial techniques" : *Modelling Earth Systems and Environment Journal*, Volume 2: 144.
4. Imam A.U.K. & U.K. Banerjee (2016), "Urbanisation and greening of Indian cities : Problems, practices, and policies": *The National Centre for Biotechnology Information Journal – Ambio*, volume 45(4): 442–457.
5. Lee, A. et al. (2015), "Value of urban green spaces in promoting healthy living and wellbeing : prospects for planning": *Risk Management and Healthcare Policy*, volume8 131-137.
6. Dhanapal G. and P Chaudhry (2012) "Open Spaces for Urban Sustainability" : *Sustainability Outlook*<http://sustainabilityoutlook.in/content/open-spaces-urban-sustainability>
7. Nath, et al (2013), "Land-Use and Land-Cover Change Modelling and Future Potential Landscape Risk Assessment Using Markov-CA Model and Analytical Modelling." : *Studies in Surveying and Mapping Science (SSMS) Volume 1 Issue 3*.

NEWSPAPER ARTICLES :

1. Roy, S. (2018), "Park revamp swallows open space", The Telegraph, Kolkata, 6.05.2018.
2. A staff reporter (2018), "Kolkata's air quality index worse than Delhi: How did it become the most polluted city in India?", India Today, New Delhi, 19.11.2018.
3. A staff reporter (2017), "Study bares loss of open space in the city", The Telegraph, Kolkata, 17.02.2017.
4. Dhara, C. (2019), "West Bengal's climate change conundrum: Why Kolkata is more heat-stressed than other megacities", Firstpost, 22.02.2019.
5. Chakraborty, S. (2017), "Bengal Government rolls out 1937 green city mission schemes", The Times of India, Kolkata, 08.09.2017.
6. Bandyopadhyay, K. (2015), "Groundwater loss puts Kolkata on shaky ground", The Times of India, Kolkata, 16.04.2015.
7. Chakraborty, S. (2016), "Development of green space and parks in all municipal towns by the state government", The Times of India, Kolkata, 30.09.2016.
8. A staff reporter (2018), "India's first urban forest to be created in Kolkata", United News of India, Kolkata, 02.04.2018.

GOVERNMENT PUBLICATION:

1. Government of India (2014), Town and Country Planning Organisation, "Urban Greening Guidelines", Ministry of Urban Development.
2. Government of India (2017), Forest and Climate Change, "AMRUT- Status of Development of Parks", Ministry of Environment.
3. Government of West Bengal (2018), "List of Existing Parks and Square, Within the Limits of Kolkata Municipal Corporation" Kolkata Municipal Corporation.
4. Government of West Bengal (2018-19), "Budget Statement", Central Municipal Office.

INTERNET WEBSITES :

1. Calcutta Centre for Contemporary Communication, "Kolkata's Urban Green Spaces" (2012)
URL : http://ccckolkata.org/wp-content/uploads/2016/07/Presentation-CCSeminar-June14-2012_small.pdf
2. Government of West Bengal, Department Of Municipal Affairs, Kolkata, 2016
URL: https://www.wbdma.gov.in/PDF/guideline_green_space_park_dev.pdf
3. <http://www.indiaenvironmentportal.org.in/files/file/urban%20green%20guidelines%202014.pdf>
4. Ghosh, S. et al. (2017). "Assessment Of Urban Sprawl and Land Use Change Dynamics, Using Remote Sensing Technique. A Study of Kolkata And Surrounding Periphery, WB, India." : Research-Gate: https://www.researchgate.net/publication/321125830_ASSESSMENT_OF_URBAN_SPRAWL_AND_LAND_USE_CHANGE_DYNAMICS_USING_REMOTE_SENSING_TECHNIQUE_A_STUDY_OF_KOLKATA_AND_SURROUNDING_PERIPHERY_WB_INDIA.
5. Kolkata Municipal Corporation, "Basic Statistics of Kolkata", URL : <https://www.kmcgov.in/KMCPortal/jsp/KolkataStatistics.jsp>
6. Government of West Bengal (2018-19), "Budget Statement" URL: https://www.kmcgov.in/KMCPortal/downloads/KMC_Budget_English_2018_2019.pdf



AIR POLLUTION IN KOLKATA

Dr. Aditi Kundu

Research Manager, Environment Conservation Society, Kolkata

Air pollution has been portrayed as a “great killer of our age” and as a “key hazard to human wellbeing” because it can extremely damage human health irrespective of sex and age (Swalha, 2019). The United Nations Environment Programme (UNEP) calculates approximately 1.1 billion people suffer from breathing problems worldwide due to detrimental air conditions.

Air pollution is a significant risk factor for multiple health conditions including respiratory infections, heart disease, and lung cancer (WHO Report, 2022). The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma, and aggravation of existing respiratory and cardiac conditions. These effects can result in increased medication use, doctor or emergency room visits, hospital admissions, and premature death. The human health effects of poor air quality are far-reaching but principally affect the body's respiratory and cardiovascular systems. Individual reactions to air pollutants depend on the type of pollutant a person is exposed to, the degree of exposure, the individual's health status, and genetics.

Air pollution cannot be eliminated completely in this industrial age, but steps can be taken to reduce it. The government has developed and continues to develop, guidelines for monitoring air quality and ordinances to restrict emissions in an effort to control air pollution. On an individual level, we can reduce our contribution to the pollution problem by carpooling or using public transportation. Additionally, buying energy-efficient light bulbs and appliances or otherwise reducing our electricity use will reduce the pollutants released in the production of electricity, which creates the majority of industrial air pollution.

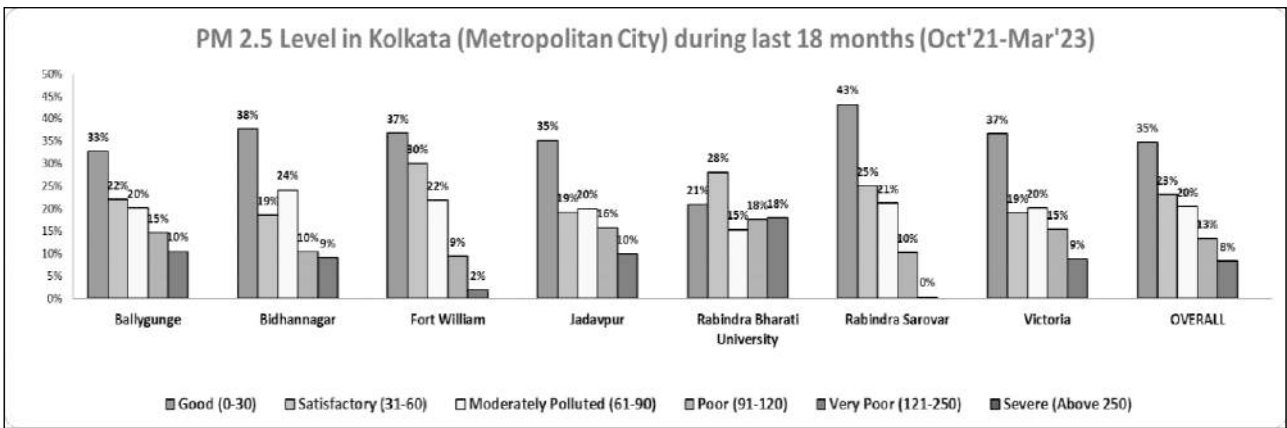
Kolkata, one of India's fastest-growing metropolises, is experiencing poor air quality. The influx of a large population from the rural areas is putting immense pressure on the city's infrastructure, making it difficult to manage it properly (Ghose et al 2004; Dutta, S., 2015). As a result, the pollution level in the city has grown at an alarming rate over the past several years.

Several factors result in the air pollution level in Kolkata. One of the main factors of air pollution is transportation. The abundance of poorly maintained vehicles, use of petrol fuel (although the government is in the process to phase out these vehicles) and poor control is making transportation the primary air-polluting sector.

According to the State of Global Air (SOGA) report, 2022, Kolkata ranks as the second most polluted city in the world. Kolkata has an annual average of 84 $\mu\text{g}/\text{m}^3$ of fine particulate matter ($\text{PM}_{2.5}$), 17 times the recommended WHO safe limit.

Analysis of Air Pollution Data

This section will put light on the trend of air pollution of Kolkata. The main pollutants considered for this analysis are $\text{PM}_{2.5}$ and PM_{10} . Data is taken from the official website of the Central Pollution Control Board (CPCB), <https://app.cpcbcr.com/ccr/#/caaqm-dashboard-all/caaqm-landing> for the period October 2021 to March 2023.



Source of Data : CPCB

Fig. 1

PM_{2.5} and PM₁₀ levels from October 2021 to March 2023 (for 546 days) in the capital city of West Bengal across 8 locations are graphically represented. Similar cartographic representations are also done for 8 selected industrial locations of the state.

Nitrogen dioxide comes mainly from the burning of fuels often in older vehicles, power plants, industrial facilities, and residential cooking and heating. As city residents tend to live closer to busy roads with dense traffic, they are often exposed to higher NO₂ pollution than residents of rural areas.

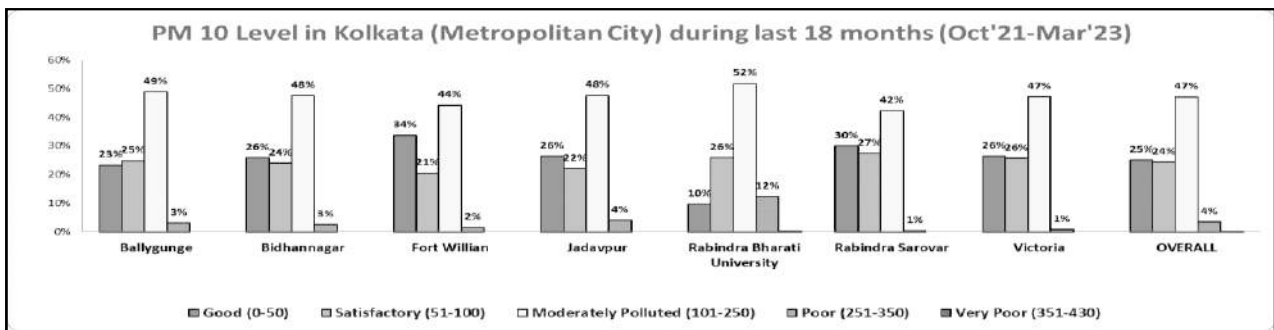


Fig. 2

Source of Data : CPCB Majority of the days during the study period, the PM₁₀ level remained between 101 and 250 in all the 8 locations of Kolkata.

Insights from the NCAP tracker (October 2021 to May 2023)

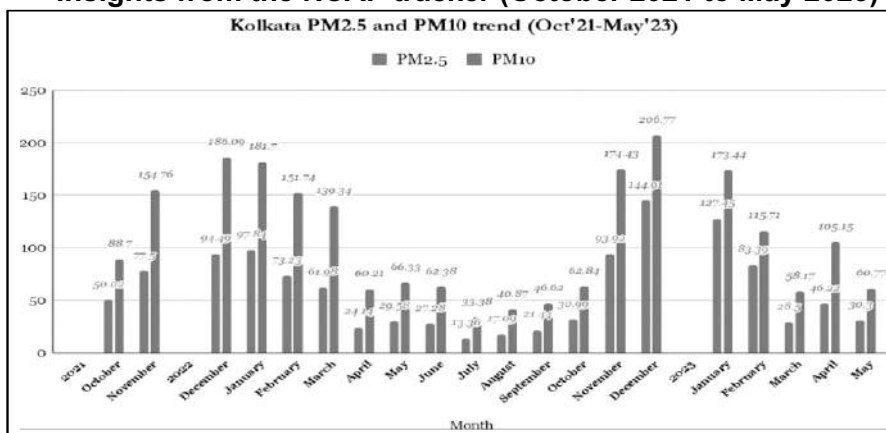


Fig. 3

Source of data : NCAP tracker – CAAQMS dashboard, Air quality trends, <https://ncaptracker.in/caaqms-dashboard/>

The NCAP tracker records higher trends of pollutants ($PM_{2.5}$ and PM_{10}) in winter months (November'21 to February '22) as compared to summer and monsoon months.

Monetary aid by the government under the wings of NCAP

The Central government has released a total of about 597.6 crores for the development of NCAP in West Bengal during 2021-2022, where about 536.5 crores are solely reserved for the city of Kolkata (PRANA, CPCB, 2022).

Kolkata is one of the most polluted cities in the world with respect to Suspended Particulate Matter (SPM). An analysis of the city's air pollution data also shows that concentrations of SPM were much higher than other pollutants. Much of the pollution described in the previous section is due to the economic and industrial development of cities and the emergence of diverse industries such as paper and pulp, organic and inorganic chemical industries, plastics, rubber, iron and other textile industries, and power plants. The main reason for poor air conditions is the high proportion of SPM, about 50% of which is from traffic and about 48% from industry. A major source of industrial air pollution is the accumulation of industries that operate using coal burning. The regulatory systems in curbing air pollution have been severely impacted by the pressure of various industrial and vehicular pollutions, degrading physico-chemical quality and biodiversity (Banerjee et al. 2021).

Scientists have found that polluted air from industries in northern India travels over 2000 km to reach the Darjeeling hills and the Sundarban Islands of West Bengal. A huge thick air mass with particles (PM) less than 2 microns is moving over West Bengal under the influence of strong north-westerly winds. At a speed of about 20 km/h, Soot travels about 2000 km between North India and parts of West Bengal. Most pollution enters Bengal during the monsoons (The Economic Times, 2016).

Recommendations

Kolkata, alongside the other cities of West Bengal, has identified many issues that contribute to air pollution and is trying to address all of them. The policies should incorporate –

- Switching to cleaner and greener energy alternatives (like solar, wind, and hydropower energy), from environmentally exploitative technologies
- Promoting climate-smart agriculture
- Encouraging segregation of solid waste management, at the household level, institution level, and community level to reduce pollution from waste
- Discourage burning of stubbles and waste in open grounds
- Adaptation of the 5Rs in waste management (reduce, reuse, repurpose, refuse, and recycle)
- Mandatory scrapping of very old vehicles
- Encouraging the use of electric vehicles
- Promoting the use of more public transportation than private vehicles
- Promoting sustainable means of transport like trams, bicycles, e-rickshaws and walking
- Traffic planning, management, and regulating the number of private vehicles
- Adaptation of third-party evaluation and certification of the transport system

Furthermore, choosing green technologies, public transport, cycling, carpooling, electric vehicles, and maintenance of vehicles and their proper servicing are some minor steps for the betterment of the environment of the Kolkata city.

References –

1. Swalha AF. Outdoor air pollution and respiratory health: a bibliometric analysis of publications in peer-reviewed journals (1900 – 2017). *Multidisciplinary Respiratory Medicine*. 2019; 13(1). DOI:10.4081/mrm.2018.146
2. Air Pollution in Kolkata, Causes, Effects & Control Measures, February 19, 2021 by Save the Air.
3. Banerjee, S., Banerjee, A. & Palit, D. Ecosystem services and impact of industrial pollution on urban health : evidence from Durgapur, West Bengal, India. *Environ Monit Assess* 193, 744 (2021). <https://doi.org/10.1007/s10661-021-09526-9>
4. Central Pollution Control Board, Ministry of Environment, Forest and Climate Change, Government of India.
5. Clean Air Action Plan For Kolkata Metropolitan Area Draft October 2022, Report of the Joint Committee, Department of Environment, Government of West Bengal.
6. IANS Agency, 'Breathless Kolkata all set to beat Delhi's dismal air pollution record', *The Economic Times*, 2022.
7. National Clean Air Programme, West Bengal Pollution Control Board, Government of West Bengal.
8. NCAP tracker – CAAQMS dashboard, Air quality trends, <https://prana.cpcb.gov.in/#/clean-air-city/dashboard/>



AMAZON RAINFOREST : DYING OR THRIVING

VAREEJA RATNA

Class of 2025

ABSTRACT :

The “**Lungs of the GAIA**”, **Amazon Rainforest**, provides us with 20% of the world's oxygen and is home to 10 percent of the world's known species. In this critical hour of environmental degradation and climate change, it also faces significant threats from human actions. Deforestation, driven by cattle ranching, mining, and development, is causing the Amazon to lose its ability to store carbon and regulate climate. This loss pushes the rainforest closer to a tipping point, where it may no longer be able to recover. Concerted efforts are underway to protect the Amazon, but its future remains uncertain. An anthropogenic disaster is going to take place in the Amazon, a heavy price that future generations will have to pay to make **Mother Earth** sustainable.

Keywords : Amazon forest, deforestation, water table, climate change

INTRODUCTION :

The crown jewel of our world is the Amazon Rainforest, a huge and thriving environment that spans about 40% of Brazil and portions of eight other South American countries. Often called the "Lungs of the Planet Earth," it plays a vital role in controlling patterns of global climate. Supporting ten percent of all known species worldwide, this biome is renowned for its extraordinary biodiversity. With its colossal kapok trees and elusive jaguars, the Amazon is a unique ecosystem on Earth. The largest tropical rainforest in the world, the Amazon rainforest plays a vital role in supplying 20% of Earth's oxygen needs. Its thick flora continuously absorbs carbon dioxide and releases oxygen, functioning as a massive air filter. The size of the jungle is so enormous that it comprises more than half of the world's remaining rainforests even though it covers only 6% of the earth's surface. Ireland and the UK could fit into it 17 times! The Amazon River which runs through the Amazon rainforest is the world's second longest river after the Nile. It is also the world's largest by water volume. The Amazon River comprises hundreds of waterways which stretch across 6,840 km, and has 17 tributaries which drain 55 million gallons of water every second into the Atlantic Ocean.



The Amazon rainforest is located in South America and spreads over an astounding 5.5 million square kilometres. The extremely rich ecosystem of the Amazon houses around **40,000 plant species, 1,300 bird species, 2,200 types of fish, 427 types of mammals, 430 amphibian species, 380 reptile species and a staggering 2.5 million different types of insects**. It shelters 10% of the world's known biodiversity. One in five of all species of birds and fish live in the Amazon. Around **400-500 indigenous Amerindian tribes** live in the Amazon rainforest.

Around 50 of them have their language and culture and have never had contact with the outside world. They are nomadic hunters and gatherers and constantly need to move around.

THREATS TO AMAZON RAINFOREST :

1. DEFORESTATION

The Amazon rainforest is a vast and vital biome teeming with life. Some of the animals living in the Amazon rainforest are bizarre and deadly. From **pink dolphins and green anacondas to poison dart frogs, bullet ants, electric eels and flesh-eating piranhas**, some of these creatures can shock you with their abilities. Around **137 species of plants, animals and insects become extinct every single day in the Amazon** because of deforestation. Deforestation, driven by, mining, logging, and infrastructure development, deforestation is rapidly stripping away the rainforest's canopy and causing the Amazon to lose its ability to store carbon and harmonise climate. Amazon has lost 20% of its size in recent years because of deforestation to create the **Trans-Amazonian Highway**. This loss pushes the rainforest closer to a tipping point, where it may no longer be able to recover. **World Wide Fund for Nature or WWF** reports that market forces, population growth, and infrastructure expansion are all contributing to the alarming rate of forest loss. This relentless deforestation disrupts the delicate ecological balance of the rainforest, leading to biodiversity loss, soil erosion, and altered weather patterns.

2. DEPLETION OF WATER TABLE

When it rains on the Amazon, it takes around 10 minutes for the water to reach the forest floor. This is because the forest is so thick that the ground remains permanently in darkness. Only 1% of the sunlight makes it to the forest ground as well making it completely dark. The Sahara Desert impacts the Amazon rainforest to a great extent by supplying phosphorus which is essential for fertilization. Dust containing phosphorus blows in from the Sahara via wind over the Atlantic Ocean and helps the rainforest flourish. A drastic amount of vegetation is cleared constantly for cattle grazing and crop production 1.5 acres are lost every second. Experts predict that the rainforest could be completely depleted in just 40 years if no action is taken to solve the problem.

3. CLIMATE CHANGE

The Amazon rainforest, a sprawling expanse of life that covers nearly 40% of South America, is in critical condition. The Amazon rainforest, vital to global ecological balance, faces threats from climate change and human actions. Unsustainable development and infrastructure projects drive deforestation, while climate change exacerbates these issues by increasing droughts and fires. This vicious cycle pushes the Amazon towards a point of no return, where rainforest conversion to Savannah becomes unstoppable. The ecological and climatic consequences of a large-scale dieback in the Amazon would be catastrophic. The **Amazon rainforest** is a carbon sink it absorbs carbon dioxide and stores it. So, it is a major player in maintaining carbon levels globally. This vast ecological treasure trove faces a multitude of threats, both natural and human-induced.

Understanding these threats is vital to preserving the Amazon for future generations. Climate change acts as a vicious multiplier of these threats. As global temperatures rise, the Amazon experiences more frequent and intense droughts. This drier environment makes the rainforest more susceptible to wildfires, which can devastate large swaths of forest. A study by the **World Wide Fund for Nature or WWF** highlights that deforestation and climate change can create a feedback loop, accelerating forest death at an alarming rate. The loss of the rainforest's vast capacity to absorb

carbon dioxide further fuels climate change, creating a dangerous ecological spiral. Climate change could spell havoc for the Amazon rainforest as **75% of it could be destroyed with just a three-degree rise in temperature**. Experts even say that the rainforest could die in just 100 years because of the global temperatures now. The impact of temperature rise will be visible to us slowly even if it is not apparent now.

4. Anthropogenic Actions

Infrastructure development : In a bid to boost economic development, Amazonian countries are increasingly investing in infrastructure projects like roads and dams. While these projects may bring short-term benefits, they fragment the rainforest, opening up previously inaccessible areas to further deforestation and resource exploitation. **Down to Earth points out that globalization is a major driver behind such infrastructure development, often leading to unsustainable practices.**

Unsustainable Practices : The unsustainable practices employed in various industries are another major threat. Cattle ranching, for instance, often involves clear-cutting forests to create pastures. Similarly, logging frequently targets valuable hardwood trees, leaving behind degraded ecosystems. These practices not only destroy the rainforest but also displace indigenous communities who have depended on it for generations.

The Tipping Point : To surmise all the above points, Scientists warn that the Amazon rainforest is approaching a crucial point, a critical threshold beyond which it can no longer function as a healthy rainforest. If deforestation and climate change continue unabated, the Amazon could transition into a savanna-like ecosystem, with profound ecological and climatic consequences. **National Geographic highlights the potential for a large-scale dieback in the Amazon, with catastrophic consequences.**



CONCLUSION : THE URGENCY TO ACT :

The Amazon rainforest is too critical to lose. Its vast network of trees plays a vital role in regulating global climate, absorbing immense amounts of carbon dioxide. The Amazon is also home to ten percent of the world's known biodiversity, and its loss would be a devastating blow to the planet's ecological health. Concerted efforts are needed to address these threats and ensure the Amazon's survival. Sustainable development practices, stricter environmental regulations, and international cooperation are all crucial steps towards protecting this irreplaceable rainforest. However, this ecological paradise faces significant threats. Deforestation, fuelled by infrastructure and agricultural development, is carving scars into the rainforest at an alarming rate. Climate change further imperils the Amazon's delicate balance. Rising temperatures and altered precipitation patterns disrupt weather cycles and threaten the survival of countless species.

The urgency to conserve the Amazon cannot be overstated. This irreplaceable ecosystem is essential for our planet's health. Saving the Amazon rainforest demands a multi-pronged approach. Supporting organizations like the **World Wildlife Fund (WWF)** that work to conserve the Amazon and empower local communities is a great first step. Reducing the consumption of beef and soy products

linked to deforestation can make a significant difference. Making conscious consumer choices by favouring **Forest Stewardship Council (FSC)** certified products ensures responsible forestry practices. Advocating stricter government policies to regulate deforestation and hold corporations accountable is crucial, Studies show that sustainable agriculture in the Amazon could halt deforestation and benefit farmers and the global climate, supporting at the grassroots level, spreading awareness about the Amazon's plight and its importance to our planet can inspire collective action.

- Stricter Government conservation policies
- Making conscious consumer choices
- Buy responsibly sourced products
- Support indigenous communities
- Strengthening grass root organizations
- Support ecotourism
- Reduce carbon footprint

BIBLIOGRAPHY :

- ARY S Jr., (2023) Amazon Rainforest- Deforestation In The Lungs Of The Earth, Asin, India
- Joana C P., Eduardo V., (2021) Climate change and biodiversity governance in the Amazon, Routledge
- Mary Schuh (2023) Animals of The Amazon Rainforest, Raintree
- <https://www.amazonconservation.org/>
- The Hindu : <https://www.thehindu.com/sci-tech/science/amazon-rainforest-the-scramble-to-save-the-planets-lungs/article67188456.ece/amp/>
- Science Direct : <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/amazon-rainforest>
- National Geographic : <https://education.nationalgeographic.org/resource/amazon-rainforest/>
- WWF: <https://www.worldwildlife.org/>



IMPACT OF COVID 19 ON HEALTH, EDUCATION, AGRICULTURE AND TOURISM IN WEST BENGAL

Ushmita Mandal, Moitreyee Baidya, Jayashree Saha, Anusree Naskar, Srijita Samadder, Debolina Hazra, Neha Adhikari, Aindrila Talukder, Sambritta Barua, Oishee Jana, Insha Shahid

Class of 2023

INTRODUCTION

On March 2020, the Corona virus disease (COVID-19), was declared as pandemic by World Health Organization (WHO). Globally, COVID-19 has not only affected public health but also greatly affected economies of the world. Substantial declines in income, employment opportunities, amenities and distractions in the transportation and industrial sectors were witnessed. As outbreak of this pandemic may recur in future, continuous development of preventive actions are required to counter infection spread, to save lives and also the economy.

OBJECTIVES

The project focuses mainly on the impact of Covid-19 on various sectors viz. health, education, agriculture and tourism. Some specific objectives of this project are to analyze the following :

- i. The spread of the virus, the severity of the illness and vaccination campaigns.
- ii. The problems related to education during lockdown.
- iii. The magnitude of impact on agriculture and allied sectors.
- iv. The impact on the tourism sector in West Bengal.

The management approaches to the impacts have also been discussed.

LITERATURE REVIEW

The covid-19 pandemic had affected the entire global scenario. India, in its way of handling the crisis had seen massive decline in the national GDP and escalation of poverty. With the metropolitan Kolkata as its capital, West Bengal crossed the hurdles significantly in the health, education and economic sectors. The health sector adopted new methods in containing the spread of the virus such as arrangement of greater number of beds, oxygen cylinders, PPE kits as mentioned in an article of the National Institutes of Health.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8590926/>].

The education sector faced significant impacts too. School and other education institutions suffered closure, witnessed higher dropout rates and delay in examinations.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8590926/#:~:text=The%20Health%20and%20Family%20Welfare,deaths%20on%20November%2020%2C%202020>]

STUDY AREA

West Bengal covers an area of about 88,752 sq. km and includes the Darjeeling Himalayan hill region, the Ganges delta, the Rarh region and the coastal Sundarbans. It has a total population of 9.13 crores. West Bengal was severely affected by the COVID-19 pandemic with the first case reported in March 2020. Since then, the state has witnessed a significant surge in the number of cases. As of March 2023, the total number of confirmed cases in West Bengal is over 3.5 million, with over 61,000 deaths.

LOCATION MAP

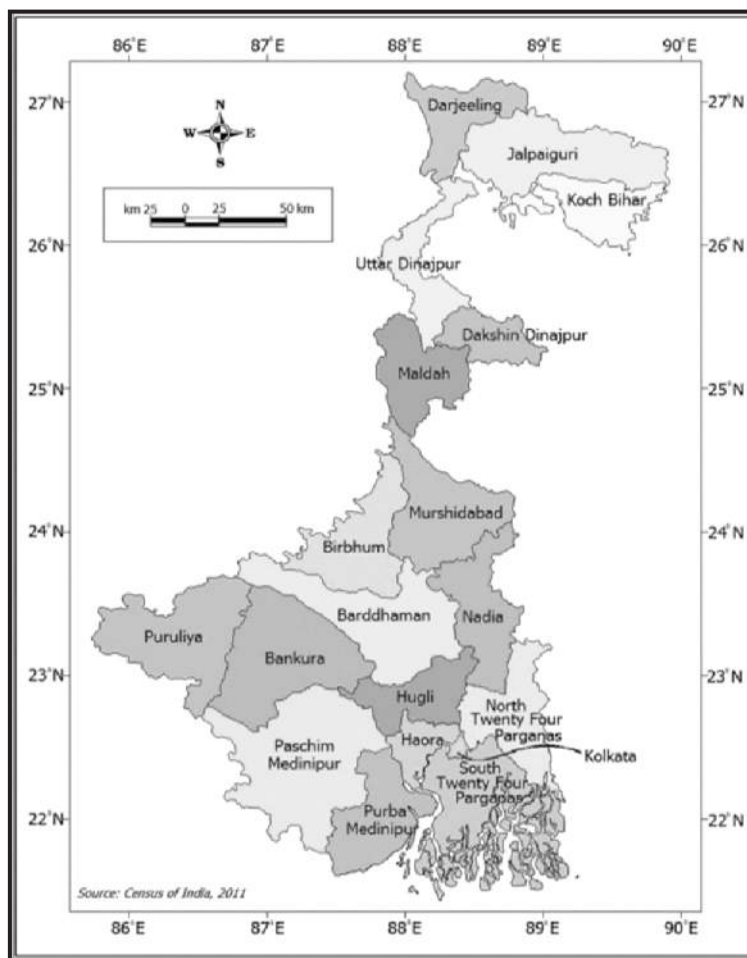


Fig. 1

METHODOLOGY

The report has been prepared on the basis of the secondary data obtained online. The secondary data has been classified as follows:

- i) Government and non-government reports
- ii) Published articles and research paper in journals
- iii) Resources from international and national organizations' website.
- iv) The vulnerable zone map has also been prepared by using GIS Software.

IMPACT ON HEALTH

The study focuses on West Bengal, which has been severely impacted by the outbreak of the novel coronavirus. Almost all districts had positive COVID-19 cases. Kolkata, having the maximum number of hospitals, became the prime centre for the testing and treatment of COVID-19 patients.

The impact of the virus started exhibiting in March 2020 and the government issued several guidelines and orders on patient handling, virus containment, protection of healthcare workers along with the lockdown rules and regulations. Hot spots and contaminated zones were classified into red, orange and green zones. COVID-19 ravaged life not only with disease and death but even precipitated

psychological dysphoria among many. Quarantine, isolation, social distancing, restriction on daily life resulted in anger, anxiety, confusion and post-traumatic issues.

A choropleth map has been prepared using QGIS software to show the vulnerable zones of Covid -19 (2021) in the districts of West Bengal. The districts of West Bengal have been divided into five vulnerable zones based on the total number of Covid-19 cases. Among the districts, it is seen that the vulnerability is very high in Kolkata, Haora, North 24-Parganas and South 24-Parganas whereas it is very low in Uttar Dinajpur, Dakshin Dinajpur, Birbhum and Puruliya. The vulnerability is high in

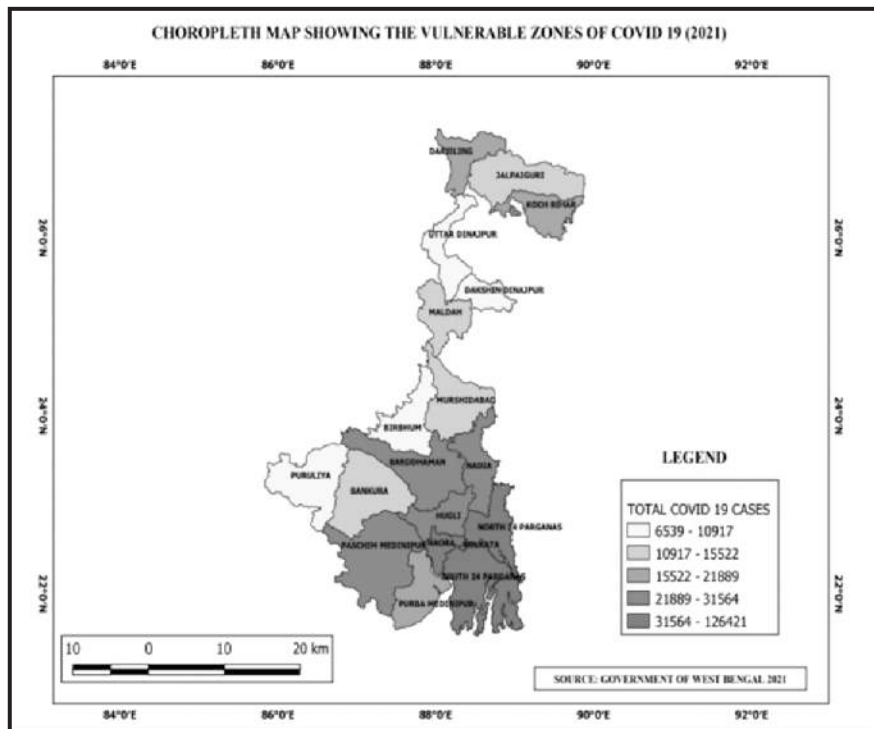


Fig. 2

Bardhaman, Nadia, Hugli and Paschim Medinipur. The districts of Purba Medinipur, Darjiling and Kochbihar are moderately vulnerable. In Bankura, Murshidabad, Malda and Jalpaiguri the vulnerability is low.

A divided proportional circle shows vaccination received by age. 56% of the vaccination dose was given to persons of age group from 18-44 years followed by 45-60 years (22%) and above 60 years (15%); the lowest was received by age group 12-17 years (7%).

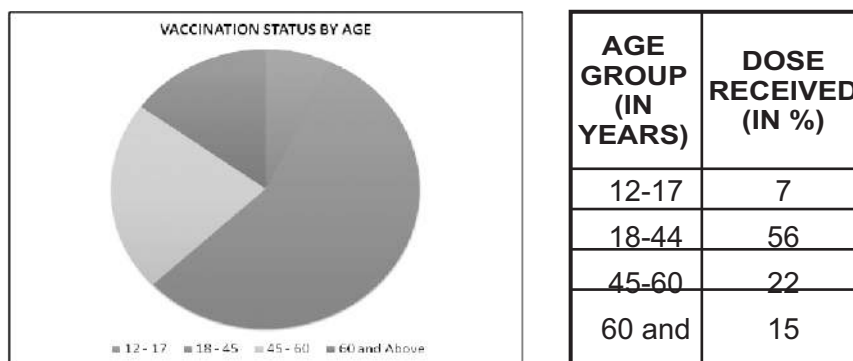


Fig. 3

Vaccination by gender shows both male and female population received same number of doses (females-46% and males-44%). Others account for only 10%.

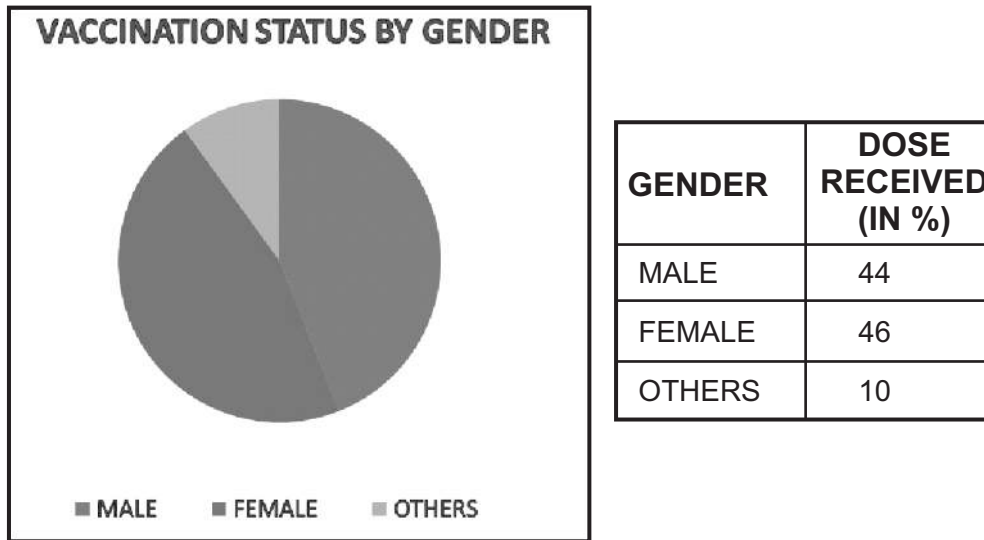


Fig. 4

IMPACT ON EDUCATION

The school education in West Bengal has been significantly impacted by the COVID-19 pandemic. School closures, diminished educational opportunities, rising dropout rates, postponed examinations, and admission delays were some of the major effects. In order to complete their education, students had to engage in online courses because the schools and institutions closed down.

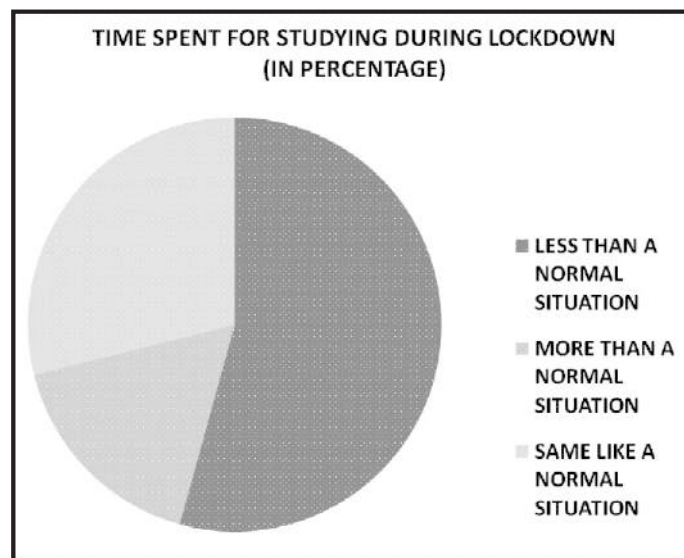


Fig. 5

Only 16.8% of the students studied for a longer duration than usual during lockdown; 54.3% spent less time 28.9% showed no change in their study time before and during the Covid period.

The platforms used for online classrooms included the Zoom app (34.2%), Google Classroom (33.4%), Google Meet (1.1%), Skype (2.2%), and YouTube videos (1.1%).

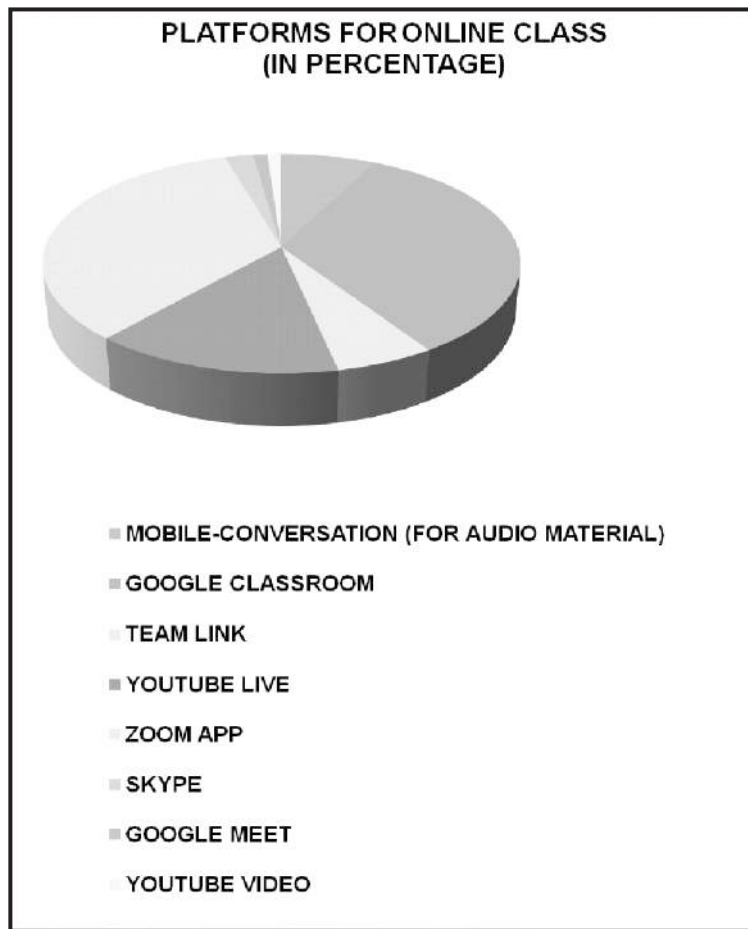


Fig. 6

It is found that 37.9% of the students used both textbooks and the internet for their studies, 35.5% of students relied on online learning, and the remaining 30.6% read textbooks independently.

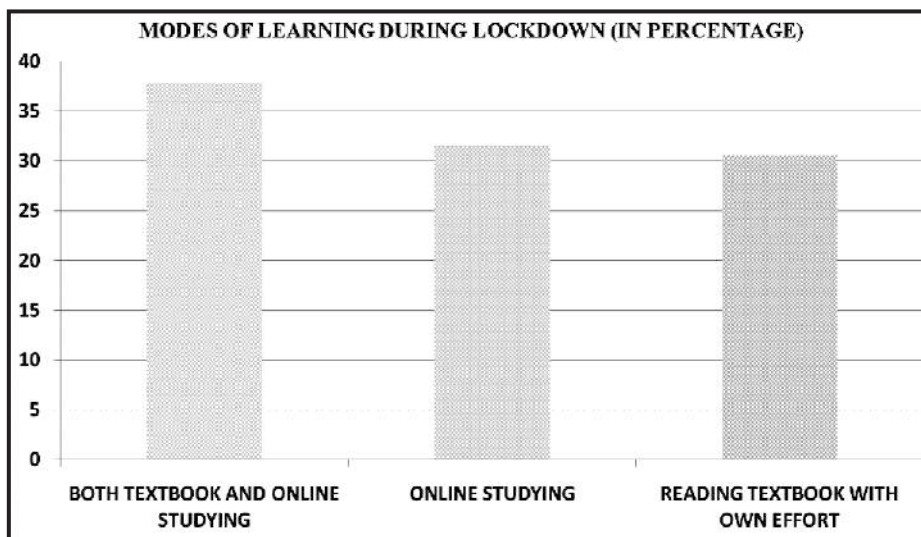


Fig. 7

During the lockdown, 42% of students experienced stress, despair, and anxiety related to their coursework. About 32.4% of students experienced network connectivity issues.

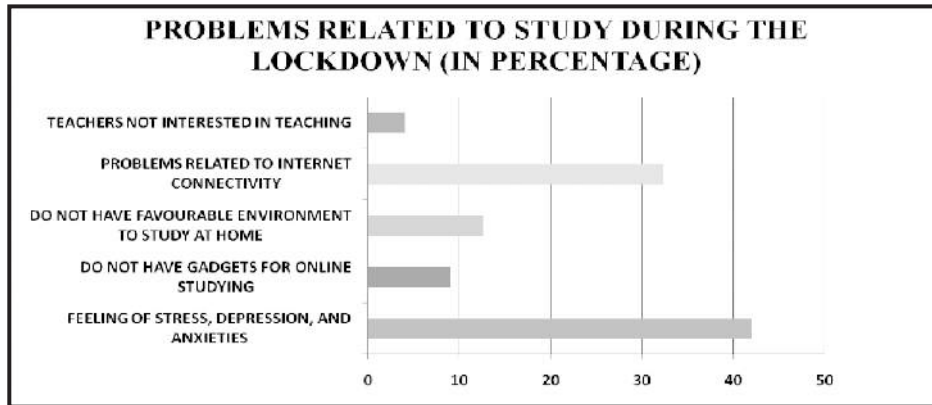


Fig. 8

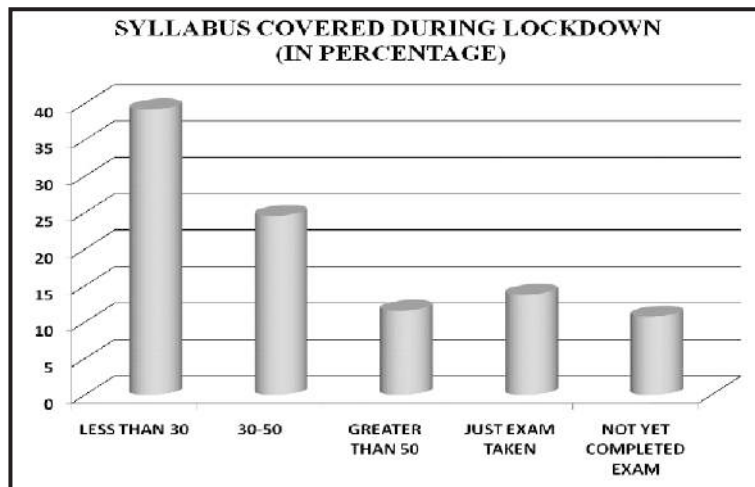


Fig. 9

It has been found that more than 50% of the syllabus was covered in only 10 schools among the total surveyed. 30-50% completed by 25 schools and less than 30 % completed by most of the schools. 10.8% of the schools have not held examinations, whereas 13.8% of institutions conducted only examinations.

A study was conducted by NCBI based on the students' perceptions. A cone diagram has been created, and it reveals that, 75.9% of students believe that COVID-19 had resulted in educational discontinuance and 15.9% of students were doubtful.

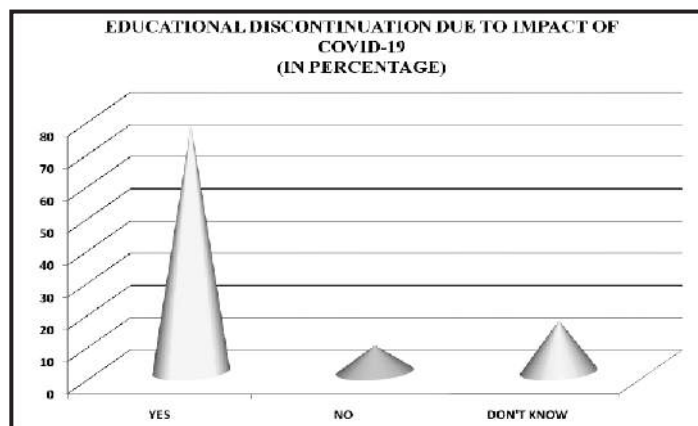


Fig. 10

EDUCATIONAL DISCONTINUATION DUE TO COVID 19 (IN PERCENTAGE)

YES	76.9
NO	8.2
DON'T KNOW	15.9

78% of students mentioned that the families have been affected economically due to Covid-19. Only 22% of the students disagreed on the negative influence of pandemic on their financial situation.

ECONOMIC CONDITION OF FAMILIES AFFECTED BY COVID-19 (IN PERCENTAGE)

YES	78
NO	22

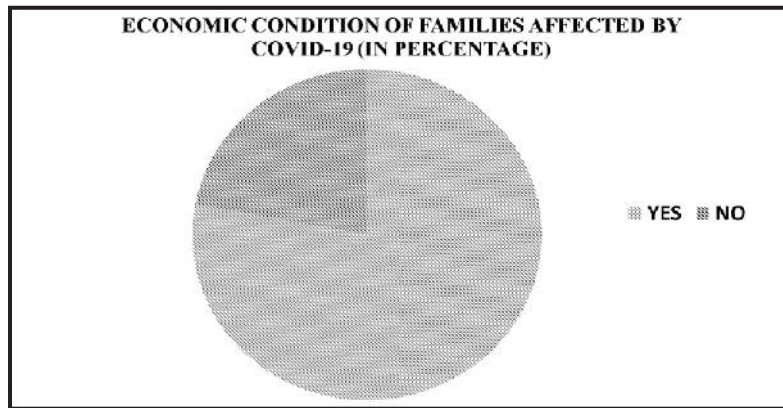


Fig. 11

A pie graph shows that the majority of students mentioned that low family income affected their ability to pursue higher education.

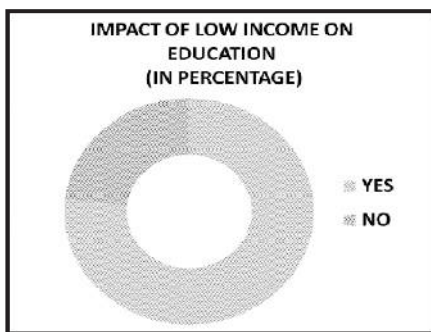


Fig. 12

IMPACT OF LOW INCOME ON EDUCATION (IN PERCENTAGE)

YES	76.7
NO	23.3



IMPACT ON ECONOMY : AGRICULTURE AND TOURISM

IMPACT ON AGRICULTURE

All economic sectors of West Bengal starting from primary to quaternary sectors were severely affected by the lockdown and pandemic effects. The lockdown hampered production and supply of all kinds of industrial product.

Covid-19 had severe impact on the supply of agricultural labourer as seen in the total seventeen surveyed districts of West Bengal. A columnar diagram shows a high proportion of decrease in labour in fourteen (82.35%) districts.

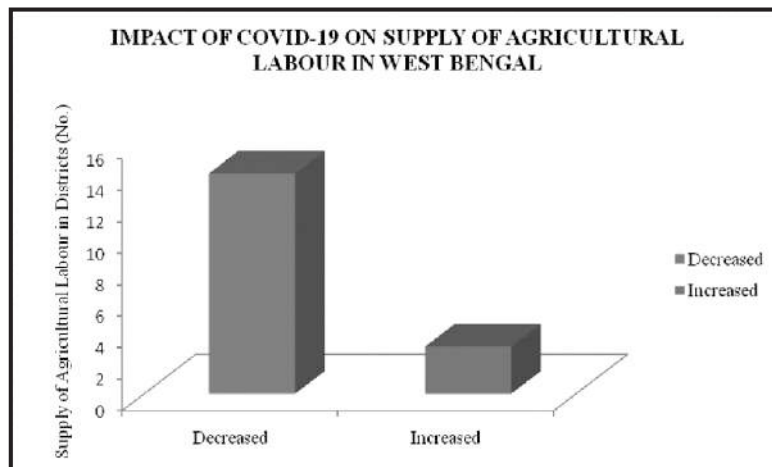


Fig. 13

The following figure shows the impact on food grain procurement by government agencies and commercialization of farmers' ability to sell. Food grain procurement in two districts (11.76%) were more favourably impacted while in sixteen districts (94.12%) farmers' ability to sell were more adversely impacted than food grain procurement. There was no impact on food grain procurement by government in eight districts and farmers' ability to sell in one district.

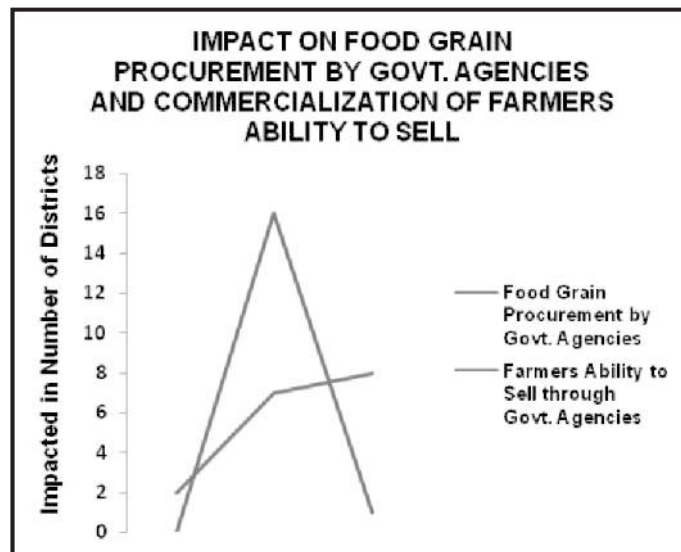


Fig. 14

It is found in West Bengal that the decrease of agricultural production was very high probably because of the lockdown situation when conditions were not conducive for the farmers.

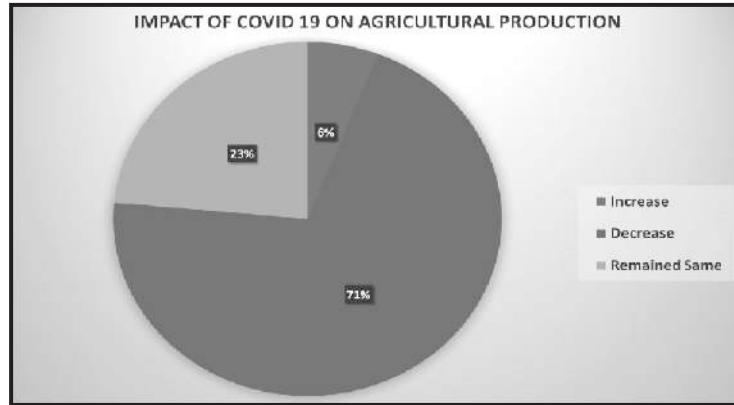


Fig. 15

IMPACT ON TOURISM

During pandemic, the tourism industry of West Bengal faced unprecedented challenges such as travel restrictions, lockdowns and border closures, which led to sharp decline in tourism activities. From the following figure 21 it is observed that, there was a massive drop in both foreign and domestic tourist movements which affected the revenue of the tourism industry.

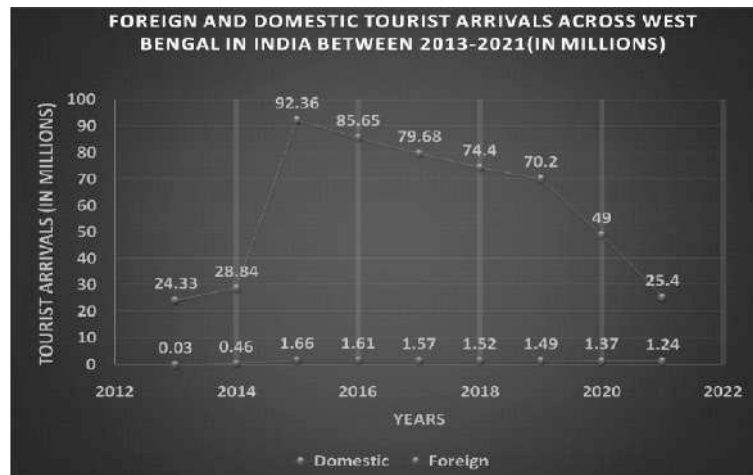


Fig. 16

NO RELIEF FOR GYMS, TOURISM YET

- Relaxations for marriages and fairs in open-air
- 200 people can attend marriages at one time or 50% of the hall capacity
- Night curf between 10 pm to 5 am to continue
- 50% capacity restrictions in bars, restaurants, cinema halls and malls
- Office attendance to be at 50%; employers to encourage work from home

After review of the current situation of the Covid pandemic and the concerns due to new Covid variant Omicron, state executive committee of state disaster management authority recommended to continue with the current restrictions in force and allow graded relaxations as necessary. Wearing of masks and maintenance of physical distancing along with health and hygiene protocol must be followed

THE NOTIFICATION

I hope this will enable the Kolkata Book Fair to be held
Sudhanshu Dey
 PUBLISHERS & BOOKSELLERS GUILD GENERAL SECRETARY

This new order is a great relief. Now, we do not have to reduce the number of guests, but will have to make sure that they come in a staggered way so that there are not more than 200 guests at any point of time
Anju Banerjee | BEHALA RESIDENT, WHOSE DAUGHTER'S WEDDING IS SCHEDULED ON JAN 24



MANAGEMENT

Health

- Campaigns were conducted to educate the public about COVID-19 symptoms, preventive measures and importance of vaccinations.

- Increased testing capacity and contact tracing efforts have been essential to identify and isolate infected individuals.
- Infrastructure has improved by expanding the number of health care facilities and medical equipments.
- Isolation facilities have been established to prevent the spread of the disease.

Agriculture

- The government has provided financial assistance, subsidies and relief measures to support farmers.
- Measures have been taken by the government to facilitate smooth functioning of agricultural market and ensure the uninterrupted movement of agricultural goods.
- Farmers have been provided with information regarding COVID-19 safety protocols and precautions.

Education

- Schools and universities have adopted online tools, to facilitate remote education. They have also provided digital learning resources including e-books, online libraries, etc.
- Different examination methods such as online quiz, assignments and open book examinations have been implemented to evaluate students' performance.

Tourism

- In the post COVID era, the situation in tourism industry has been uncertainty about international trips as some countries retained travel restrictions for a long time.
- The state government has announced various measures to revive the industry, such as providing financial assistance to tourism stakeholders, promoting domestic tourism and easing travel restrictions.
- For maintaining social distancing and avoiding human touch, hotels and accommodations showed an inclination towards zero-personal-contact vacations.
- Mandatory use of masks, reduced capacity in transportation accommodation, regular sanitation and temperature checks are some common protocols that continued for a long time.
- Post Covid19 destinations and hospitality sectors made far-reaching structural changes towards sustainability.

CONCLUSION

The present project, gives a brief idea about how different sectors of West Bengal have been affected due to the spread of Covid-19. The infectious disease outbreaks and epidemics have now become global threats requiring a collective response. Overall the importance of Covid-19 lies in its impact on public health, scientific advancements, societal adaptations, health inequalities and future preparedness.

REFERENCES

1. https://en.m.wikipedia.org/wiki/Geography_of_West_Bengal
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8590926/#:~:text=The%20Health%20and%20Family%20Welfare,deaths%20on%20November%2020%2C%202020>
3. <https://www.jchm.in/html-article/12413>
4. <https://www.hindustantimes.com/cities/kolkata-news/covid19-pandemic-has-taken-heavy-toll-on-learning-abilities-of-kids-report-101644405786951.html>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8590926/#:~:text=The%20Health%20and%20Family%20Welfare,deaths%20on%20November%2020%2C%202020>

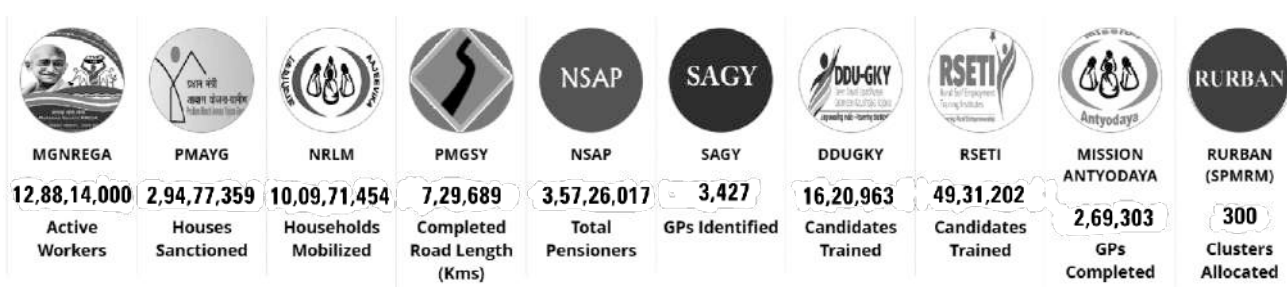
RURAL DEVELOPMENT IN INDIA

Class of 2025

Rural development refers to the method of enhancing the quality of life and financial well-being of individuals, specifically living in populated and remote areas. Traditionally, rural development was centred on the misuse of land-intensive natural resources such as forestry and agriculture. However today, the increasing urbanisation and the change in global production networks have transformed the nature of rural areas. Rural development still remains the core of the overall development of the country. More than two-third of the country's people are dependent on agriculture for their livelihood, and one-third of rural India is still below the poverty line. Therefore, it is important for the government to be productive and provide enough facilities to upgrade their standard of living. Rural development is a term that concentrates on the actions taken for the development of rural areas to improve the economy. However, few areas that demand more focused attention and new initiatives are:

- Education
- Public health and Sanitation
- Women empowerment
- Infrastructure development (electricity, irrigation, etc.)
- Facilities for agriculture extension and research
- Availability of credit
- Employment opportunities

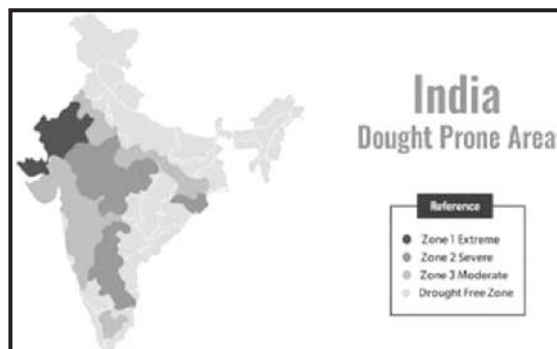
The area-based approach to human development recognizes that challenges and opportunities for development vary across geographical regions. It targets interventions to address the specific needs of each area. India has adopted this approach through initiatives like state-specific Human Development Reports and schemes like Pradhan Mantri Gram Sadak Yojana, which tailor's road development to individual villages. This focus on local needs ensures a more equitable distribution of resources and fosters improvement in areas lagging behind.



India has actively invested in rural development through various programs. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) guarantees rural families 100 days of work a year, while the Pradhan Mantri Gram Sadak Yojana builds roads in villages to improve connectivity. Additionally, programs like Self Help Groups empower women by providing microfinance and fostering leadership skills. Drought prone area programmes, PMGSY, SJSY, Jan Dhan Yojana. These initiatives aim to create a more robust rural economy and improve the overall quality of life for people in remote areas

DROUGHT PRONE AREAS PROGRAMME

Drought Prone Areas Programme (DPAP) is the earliest area development programme launched by the Central Government in 1973-74 to tackle the special problems faced by those fragile areas, which are constantly affected by severe drought conditions.



AIMS AND OBJECTIVES :

- To reduce the severity of the impact of drought on the production of crops and livestock and productivity of land, water and human resources.
- To establish the income of the people particularly weaker sections of the society and aims to achieve an overall economic development.
- To restore the ecological balance through watershed management for land development and afforestation or pasture development.

STRATEGIES

- To increase in employment avenues and productive assists.
- To increase the fertility of land and productivity of labour.
- To introduce relief operations and programmes of afforestation in terms of irrigation projects.

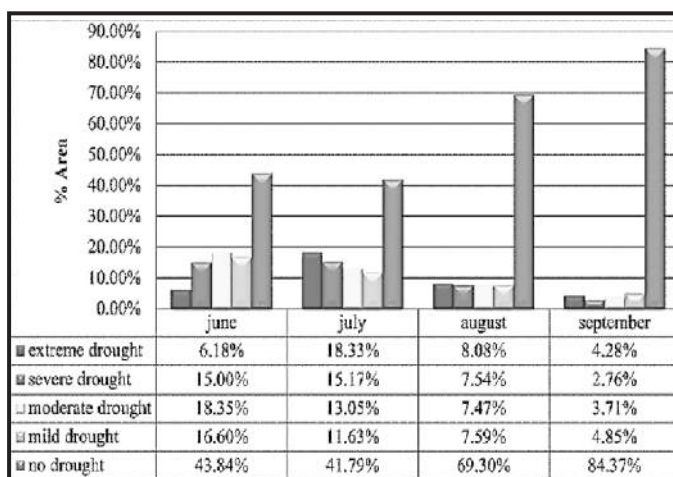


Fig: Bar graph showing percentage areas under various drought classes in 2019.

COVERAGE : The Drought Prone Areas Programme was in operation in 627 blocks of 96 districts in 13 States during 1994-95. Later coverage of the programme was extended to 947 blocks of 164 districts in 13 States. With the reorganization of States, districts and blocks, at present the programme is under implementation in 972 blocks of 182 districts in 16 States.

FUNDING PATTERN : Until 1999 the funds were shared on 50:50 basis between the Central Government and the State Governments. Later the funding was shared on 75:25 basis. However, with effect from 1.4.2000, uniform cost norms @ Rs. 6000/- per ha. have been introduced. These norms are applicable to projects sanctioned during and after 2000-2001. In respect of earlier projects sanctioned up to 1999-2000, the pre-revised cost norms will be applicable.

OVERALL PERFORMANCE : Under DPAP, during 2004- 2005, 2550 new projects have been sanctioned and these are to be implemented under the Guidelines for Hariyali. These projects shall cover an area of 12.75 lakh hectare, and the total cost for these projects is Rs. 765.00 crore involving Central share of Rs.573.75 crore.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

The Mahatma Gandhi National Rural Employment Guarantee Act or MNREGA is an Indian job guarantee scheme enacted by legislation on **September 7, 2005**. The Act provides a legal guarantee

for a minimum of one **hundred days of employment** every year to adults or the working members of any rural household willing to do unskilled manual labour. MGNREGA stands as a beacon of hope for millions in India with its legal guarantee ensuring employment for rural citizens. Designed specifically for rural areas. MGNREGA plays a pivotal role in curbing migration by offering **job opportunities** locally. It provides **wage security** to workers engaged in unskilled labour, contributing to their livelihoods. Moreover, the program facilitates **infrastructure development** in rural regions, thus enhancing overall **socio-economic growth**. Notably, MGNREGA emphasizes **women's empowerment**, fostering gender equality and participation in the workforce. Through these concerted efforts, MGNREGA continues to **uplift rural communities** and strengthen the nation's social fabric.

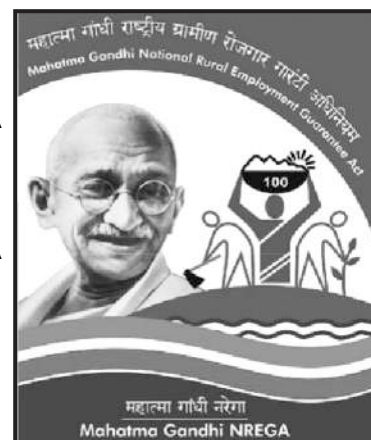
To increase the employability of rural areas and bridge the gap between the upper and lower class, the Government of India introduced the scheme in 1991. The step was initiated by then Prime Minister P.V. Narasimha Rao to boost employment in the country. It was initially named as National Rural Employment Guarantee Act in 2005, which was later changed to Mahatma Gandhi National Rural Employment Guarantee Act in 2009.

AIMS AND OBJECTIVES

Livelihood Security : MGNREGA aims to provide livelihood security to rural households by guaranteeing 100 days of wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work. This ensures that rural households have access to a minimum level of income and employment opportunities, thereby reducing vulnerability to poverty and distress.

Poverty Alleviation : One of the primary objectives of MGNREGA is poverty alleviation. By providing employment and wages to rural households, particularly during lean agricultural seasons, MGNREGA helps in augmenting household incomes and reducing dependence on distress migration and poverty.

Asset Creation and Infrastructure Development : MGNREGA emphasizes the creation of durable and productive assets in rural areas. By engaging rural households in the construction of assets such as roads, water conservation structures, and rural infrastructure, the program aims to improve connectivity, access to basic services, and overall quality of life in rural areas.



Promotion of Sustainable Development : The program promotes sustainable development by focusing on asset creation that contributes to environmental conservation, natural resource management, and sustainable livelihoods. Activities such as afforestation, soil conservation, and water harvesting undertaken under MGNREGA contribute to environmental sustainability and resilience in rural areas.

Gender Empowerment : MGNREGA seeks to empower women by ensuring their participation in wage employment activities and decision-making processes related to program implementation. The act mandates that at least one-third of the beneficiaries should be women, thereby promoting gender equality and women's empowerment in rural India.

Social Inclusion and Equity : MGNREGA aims to address social disparities and promote inclusive growth by targeting marginalized communities such as Scheduled Castes (SCs), Scheduled Tribes

(STs), and other vulnerable groups. Special provisions are made to ensure equitable access to employment opportunities and benefits under the program.



The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has faced several criticisms over the years :

Implementation Challenges : Critics argue that MGNREGA suffers from inefficient implementation, including delays in wage payments, corruption, and lack of proper monitoring.

Work Quality : Some contend that the quality of work generated under MGNREGA is often substandard and does not contribute meaningfully to rural infrastructure development.

Distortion of Labour Markets : There are concerns that MGNREGA artificially inflates wages in rural areas, leading to distortions in labour markets and affecting productivity in other sectors.

Dependency : Critics argue that MGNREGA fosters a culture of dependency on government handouts rather than promoting sustainable livelihoods and economic growth in rural areas.

Fiscal Burden : There are concerns about the fiscal burden of MGNREGA on government finances, particularly during economic downturns when demand for rural employment spikes.

Limited Skill Development : The scheme has been criticized for not adequately focusing on skill development and capacity building among rural workers, which could hinder their long-term employability.

Environmental Impact : Some critics argue that MGNREGA projects may have adverse environmental impacts if not properly planned and executed, leading to deforestation, soil erosion, and other ecological issues.

The Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) stands as a pivotal measure in India's efforts to address rural unemployment and poverty. By providing a legal guarantee of employment, MNREGA ensures livelihood security for millions of households in rural areas. The conclusion on MNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) would vary depending on one's perspective. Some may argue that it has significantly contributed to rural livelihoods, poverty reduction, and infrastructure development, while others may criticize its implementation, citing issues like corruption, leakages, and inefficiencies. Overall, MNREGA remains a crucial tool in India's social welfare framework, but continued reforms and improvements are necessary to maximize its effectiveness and address existing challenges

SWARNAJAYANTI GRAM SWAROZGAR YOJANA (SJSY)

Swarnajayanti Gram Swarozgar Yojana Scheme is a holistic approach towards poverty eradication in rural India through creation of self-employment opportunities to the rural Swarozgaris. SGSY came into existence in 1999-2000 duly merging the schemes of Integrated Rural Development Program (IRDP), Training for Rural Youth under Self Employment (TRYSEM) Development of Women & Children in Rural Areas (DWCRA) and Supply of Improved Toolkits to Rural Artisans (SITRA).

AIMS AND OBJECTIVES :

SGSY aims to uplift poor families above the poverty line by providing income-generating assets, bank credit and government subsidy. It focuses on women's self-help groups and community involvement. It aims to establish micro-enterprises in rural areas based on local potential. It covers various aspects of self-employment, including organization, capacity building, planning, infrastructure, and market support.



- 1) The main principles of SGSY are :
 - Key activities
 - Cluster approach
 - Group method
- 2) The programme predicts establishing a large number of micro enterprises by the poor in the rural areas with an emphasis on four to five key activities identified at the block level based on resources, occupational skills of the people and availability of markets.
- 3) This scheme is a credit-cum-subsidy program. Subsidy under SGSY is uniform at 30% of the project cost subject to a maximum limit of Rs. 7500/-.

The Swarnajayanti Gram Swarozgar Yojana organizes the rural poor into SHGs. It implements inclusion of the poorest. It provides assistance to take up economic activities. It provides infrastructural support and technology. The Swarnajayanti Gram Swarozgar Yojana (SGSY) stands as a pivotal initiative aimed at empowering rural communities by fostering self-employment opportunities and enhancing their socio-economic status. As we conclude, it's evident that SGSY has not only empowered individuals but has also fostered sustainable development at the grassroots level, laying a strong foundation for a more prosperous and equitable India.

Pradhan Mantri Gram Sadak Yojana (PMGSY)

Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 to increase rural road connectivity with a view to promote greater access to economic and social services and thereby generate increased economic and social opportunities in rural India. The rural road connectivity is a key component of rural development, which promotes access to economic and social services and thereby generating increased agricultural income productive employment opportunities in rural India as well as ensures sustainable poverty reduction program. This rural connectivity is essential for the overall development of the rural areas.

AIMS AND OBJECTIVES

1. Connecting unconnected habitations
2. Enhancing socio-economic development
3. Boosting agricultural productivity
4. Promoting rural employment
5. Improving connectivity to schools and healthcare facilities



Conclusion

The program is a big success with two lakh kilometres of road work already completed. The program when completed provides connectivity to large number of unconnected rural habitations. But, the maintenance of vast network of rural roads is a major challenge and requires significant annual maintenance budget.

PRADHAN MANTRI JAN DHAN YOJANA (PMJDY)

Pradhan Mantri Jan Dhan Yojana (PMJDY), one of the biggest financial inclusion initiatives in the world, was announced by Prime Minister, Shri Narendra Modi on 15th August 2014 from the ramparts of the Red Fort. While launching the programme on 28th August, the Prime Minister had described the occasion as a festival to celebrate the liberation of the poor from a vicious cycle. Shri Narendra Modi had referred to the ancient Sanskrit verse : Sukhasya Moolam Dharma, Dharmasya Moolam Artha, Arthasya Moolam Rajyam – which puts the onus on the state to involve people in economic activity. “This Government has accepted this responsibility,” the Prime Minister said & the Government.

There are some benefits of PMJDY present which are –

- 1) **No minimum balance requirements** : PMJDY accounts are zero-balance accounts and do not require any minimum balance to be maintained. This makes it easier for low-income groups and rural households to access banking services.
- 2) **Debit card and over card facility** : PMJDY account holders are provided with a RuPay debit card for easy transactions. They can also avail of an overdraft facility of up to ₹10,000, subject to eligibility criteria and account performance.
- 3) **Financial stability** : The scheme aims to promote financial literacy by offering information about the importance of saving, insurance and responsible borrowing. PMJDY is designed to create awareness among people about the benefits of financial planning and to inculcate a habit of savings among households.
- 4) **Direct benefit transfer** : PMJDY is also geared towards providing banking facilities to disadvantaged and marginalised sections of society, who receive benefits from various government schemes. Through direct benefits transfer, recipients will be able to receive financial assistance from the government without intermediaries, reducing corruption and increasing transparency.
- 5) **Universal access** : The main objective of PMJDY is to ensure that every Indian has access to basic financial services such as a savings account, debit card and insurance. This would help to curb financial exclusion and promote inclusive growth. The scheme has three phases; Phase 1:

15 August, 2014-14 August, 2015 : Universal access to banking facilities for all households across the country through a bank branch or a fixed-point Business Correspondent (BC) within a reasonable distance. To cover all households with at least one basic banking account with RuPay Debit Card with inbuilt Rs. 1 lakh accident insurance cover. Phase II – 15 August, 2015 - 14 August, 2018 : Providing micro-insurance to the people. Unorganized sector pension schemes like Swavalamban through the Business Correspondents. Phase III – beyond 14 August, 2018 : The flagship financial inclusion program (PMJDY) will focus on opening accounts from "every household to every adult". Existing over Draft (OD) limit of Rs. 5,000 to be raised to Rs. 10,000. There will not be any conditions attached for OD up to Rs. 2,000.

The scheme has some drawbacks which are –

- 1) Technology : The lack of appropriate infrastructure and slow internet speeds in rural areas has hindered the uptake of digital modes of banking and has made it difficult for customers to access their account.
- 2) Financial Literacy : Despite efforts to promote financial literacy, many people are still unaware of the benefits of formal banking. This has resulted in low usage of PMJDY accounts.
- 3) Product Design : The product design of PMJDY does not cater to the specific needs of certain groups such as women, transgender person. In conclusion, PMJDY has undoubtedly been a game-changer for financial inclusion in India. It has enabled millions of households to access formal financial services and has brought them into the mainstream economy. Nevertheless, there is still a long way to go before we can achieve universal financial inclusion in the country. By addressing the key challenges and continuing to innovate, PMJDY has the potential to transform the financial landscape of India and drive further economic growth and development.

BIBLIOGRAPHY :

1. <https://www.livemint.com/money/personal-finance/pradhan-mantri-jan-dhan-yojana-from-benefits-to-impact-all-you-need-to-know-11697440909622.html>
2. <https://groww.in/p/savings-schemes/pmjdy>
3. <https://pmjdy.gov.in/scheme>
4. <https://www.bankofbaroda.in/personal-banking/accounts/pradhan-mantri-jan-dhan-yojana>



A SMALL CHANGE CAN LEAD TO BIG ENVIRONMENTAL IMPACT

Riyanka Banerjee

Class of 2025

Nowadays, we cannot go a single day without hearing about the distressed and deteriorating state of our environment. It is caused by a variety of factors, ranging from human activities to natural disasters, and its effects can be devastating. To avoid getting overwhelmed by all the things we can do to help the environment, let's take one step at a time. Remember, it's a small change that can make a big impact.

First and foremost solution for sustainable future for communities all around the planet is to grow more and more plants. Taking ones own grocery bags for shopping and carrying ones own water bottles instead of buying one will help reduce use of plastic reducing the impact of plastic pollution. Plastic packaging blights our streets, finds its way into oceans harming wildlife and takes centuries to break down whilst releasing toxic chemicals. Single use plastic bottles are the most prevalent form of plastic packaging in our oceans and accelerated action is needed to phase out non-recyclable plastic packaging. Use real dishes rather than paper plates. Instead of using plastic wrap, try reusable beeswax paper or fabric bowl covers. Switch from plastic baggies to washable and reusable silicone food bags. Switching from traditional incandescent lightbulbs to compact fluorescent lightbulbs (C.F.L.) will make your household more energy-efficient, saving you money each month. Although they are expensive, but they are long lasting so they are definitely worth investment. Electricity can be saved by simply unplugging the electronic gadgets which are not in use all the time.



The way we move around can have a significant environmental impact. If possible, opt for public transportation, carpooling, biking, or walking instead of driving alone in a gas-guzzling vehicle. Travelling by train can decrease carbon emissions by 10 times per passenger, compared to travelling by car. This small change can make a massive difference. Changing small details in our household can collectively make a huge impact; simple things like rethinking lighting of the house to managing waste. Consider bringing new life into your current clothes or purchasing used clothes from vintage stores, consignment shops or thrift stores as an alternative to buying new clothes off the rack. Manufacturing clothing serves as a large source of carbon emission and contributes to the destruction of fragile ecosystems across the globe. Next time you need a little black dress or a new tie, consider digging deep into your closet, phoning a friend or visiting a local thrift shop.

While the challenges facing our environment may seem daunting, it's empowering to recognize that even small changes within ourselves can collectively make a significant impact. By adopting sustainable habits, embracing mindfulness in consumption, and fostering a deeper connection with nature, we not only contribute to the preservation of our planet but also inspire others to join in the journey towards a greener, more sustainable future. Remember, it's the ripple effect of individual action that ultimately shapes the tide of environmental change.

SUNDARBAN – A RAMSAR SITE

Riyanka Saha

Class of 2025

The World's largest delta formed by the three main rivers of India- Ganges, Meghna and Brahmaputra is home to uncountable varieties of species of birds, reptiles and the largest Royal Bengal Tiger reserves. **Sundarbans**, named after the abundance of Sundari trees is a mangrove forest, covering 140,000 hectares. The name Sundarbans finds its meaning back in the roots of the rich Bengali language, where it means, 'beautiful forest'.

Sundarbans stand as a strong example of an ecologically balanced environment, as it straddles the border between India and Bangladesh, where two adjacent world heritage sites protect a quarter of the delta's total area. About 60% of the forest falls into Bangladesh and 40% into India's West Bengal region. Indian Sundarban is bound on the west by river Muriganga and on the east by rivers Harinbhanga and Raimangal. Other major rivers flowing through this ecosystem are Saptomukhi, Thakuran, Matla and Goasaba.



Location of the Sundarbans

What shines amidst the dense wild unexplored of Sunderbanjungle is the unique ecosystem of the extensive area that combines mangrove forests, tidal rivers, and estuaries, creating a dynamic environment that supports a wide range of plants and animal species. The Sundarbans is the world's richest mangrove forest, with 78 species of mangroves recorded in the area. Sheltering around 260 bird species namely kingfishers, herons and white-bellied sea eagles, 42 mammals, 35 reptiles and eight amphibian species it proudly stands as the only reserve for saltwater crocodiles, Indian Python, and the endangered **Pantheratigris**.



Location of the Sundarbans

The Sundarbans is made up of closed and open mangrove forests, a multitude of small islands and mudflats, land used for agricultural purposes, and barren land, and is intersected by multiple tidal streams and channels. The delta is in a constant state of a complex balance of ecological change in response to monsoon flooding, siltation, erosion, tidal influence, freshwater inflow, plant colonization and the impact of severe weather events such as cyclones.

Geologically, the Sundarban delta is the largest prograding delta in the world. The region is covered solely by quaternary sediments carried and deposited by the rivers Ganges, Matla & Bidyadhari. The Sundarban Biosphere Reserve has an extremely rich diversity of aquatic and terrestrial flora and fauna. Sundarbans highly productive ecosystem acts as a natural fish nursery.

Sundarban Mangrove reduces the fury of cyclonic storms and prevents erosion due to tidal action. Millions of people depend on the Sundarban Ecosystem for their livelihood and sustenance through fishing, collection of honey, fuel wood and timber. The Sundarbans provide sustainable livelihoods for millions of people in the vicinity of the site and act as a shelter belt to protect the people from storms, cyclones, tidal surges, sea water seepage and intrusion. The area provides livelihood in certain seasons for large numbers of people living in small villages surrounding the property, working variously as wood-cutters, fishermen, honey gatherers, leaves and grass gatherers.

However, rising sea levels due to melting of glaciers and thermal expansion of ocean waters pose a major risk to the region in terms of flooding. The average elevation of the Sundarbans is lower than one metre above sea level, which makes the region highly vulnerable to flooding due to sea-level rise. The sudden influx of tourists also has severely degraded the ecosystem.

Considerable research has been conducted on the Sundarbans wildlife and ecosystem. International input and assistance from WWF and the National Zoological Park, the Smithsonian Institution as well as other organisations have assisted the development of working plans for the property, focusing on conservation and management of wildlife. The Sundarbans, due to its unique ecosystem, has also been declared a World Heritage site in 1989. Sundarban Biosphere Reserve has also been included as the second Biosphere Reserve from India, other than Nilgiri Biosphere Reserve, in the global network of Biosphere Reserves, in November 2001. Four protected areas in the Sundarbans are enlisted as UNESCO World Heritage Sites : Sundarbans West, Sundarbans South, Sundarbans East, and Sundarbans National Park.

The Sundarbans Wetland, India was recognised as the Wetland of International Importance under the Ramsar Convention in January 2019. It is the 27th Ramsar Site in India and is now the largest protected wetland in the country.

Nature has time and again stood out as an outstanding example despite repeated exploitation by humans. It has to be our sole responsibility to treasure our country and our nature and resort to sustainable living.

BIBLIOGRAPHY :

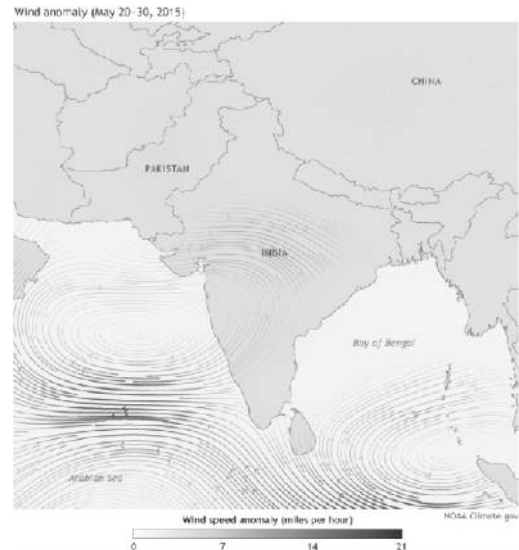
- <https://ssdcindia.org.in>
- <https://en.m.wikipedia.org>
- <https://whc.unesco.org>



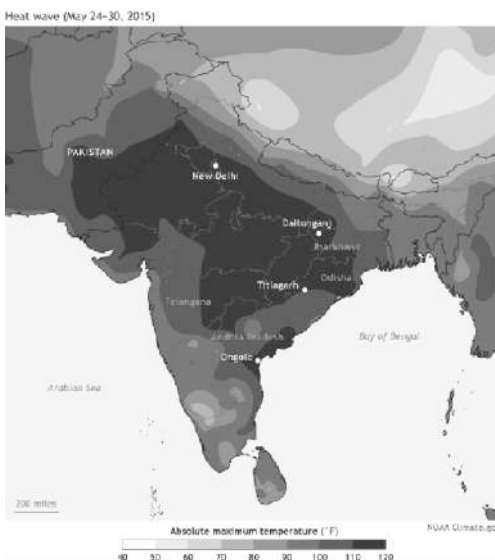
HEATWAVE IMPACT SCORCHING SECTORS AND MELTING ECONOMIC GROWTH IN INDIA

Shreja Saha
Class of 2024

Amid relentless climbs in mercury across the Indian subcontinent, a formidable threat emerges, transcending mere discomfort. From agriculture to healthcare, rising temperatures echo through sectors, imperiling the nation's economic stability. How does a heatwave impact the world's third-largest economy? Unusual northwesterly winds have played a role, overpowering moist southerly winds and keeping pre-monsoon showers at bay, allowing hot air from the northwest deserts to spread. Climate change-induced global warming, urbanization, deforestation, and shifts in weather patterns further exacerbate the situation, crippling agricultural productivity, straining energy resources, and hampering workforce efficiency, posing substantial challenges to sustained economic growth.



Map by NOAA Climate.gov and Fiona Martin,
based on NCEP/NCAR Reanalysis data.



NOAA Climate.gov map by Fiona Martin,
based on interpolated weather station data
provided by the India Meteorological

According to **Economist Benjamin F. Jones**, "higher heat, especially when starting with already high temperatures, is extremely costly to an economy, especially true for developing nations. When a lower-income country has a year that is one degree warmer than normal, its growth is 1% to 2% lower – this is huge. If India was growing at, say, 6% and experienced a one-degree rise in temperature, that growth could drop to 5%, which is a very large difference."

Impact on India's Food Economy :

- Heatwaves trigger commodity shortages and inflation spikes.
- Crop damage and reduced yields exacerbate the crisis.
- Livestock productivity declines, escalating milk prices,

while poultry and fishery sectors suffer.

Pressure on India's Power Sector :

- Heatwaves strain electricity grids with sudden consumption spikes.
- Increased demand for power leads to potential shortages.
- Risks disruptions in power supply and infrastructure strain.

"There will be a loss of 10% to 30% of fruit and vegetable crops in different regions this year due to the sudden increase in temperatures" SK Singh, director of the Indian Institute of Horticulture Research (IIHR), Bengaluru.

Labor Productivity Challenges :

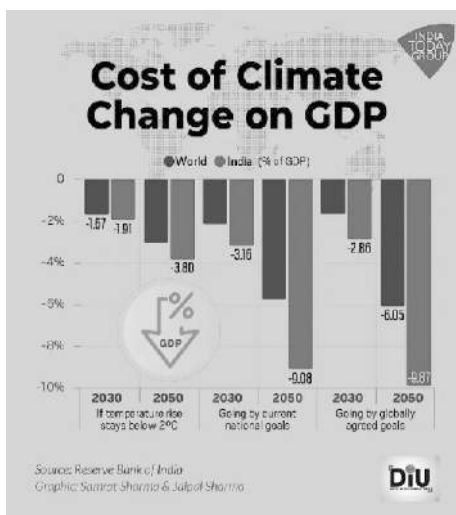
- Extreme heat affects 75% of India's workforce, potentially resulting in 34 million job losses by 2030.
- Economic challenges and impacts on public health are exacerbated.
- Risks substantial GDP reduction as temperatures rise and daylight working hours diminish.

Threat to India's GDP Growth :

- Heatwaves exacerbate the loss of economic productivity and strain various sectors.
- Drive up inflation and deteriorate macroeconomic conditions. Even a slight decline in GDP growth due to extreme heat poses a severe setback to India's economic aspirations.

McKinsey & Company's analysis suggests that rising heat and humidity could alone put up to 4.5% of India's GDP at risk by the decade's end, with about 50% of the GDP already dependent on heat-exposed work, particularly in vulnerable sectors like agriculture, mining, construction, and manufacturing.

Hetal Gandhi, Director of Research at CRISIL Market Intelligence & Analytics, warns "that a hotter-than-usual summer. Rising temperatures fuel increased appliance usage, especially ACs and ground water pumps, exacerbating electricity scarcity and impacting industries reliant on power."



As the nation grapples with the multifaceted challenges posed by heat waves, it becomes increasingly clear that decisive action is imperative. Addressing the cause, from climate change to urban planning, is essential to mitigate the impacts on India's economy and society. Collaboration between policymakers, industries, and communities is vital to implementing effective adaptation and resilience measures. By prioritizing sustainable practices and investing in innovative solutions, India can navigate through the heatwave threat, safeguarding its economic prosperity and will be able to secure a resilient future for generations to come.

Data source :

- <https://www.climate.gov/news-features/event-tracker/india-heat-wave-kills-thousands>
- <https://economictimes.indiatimes.com/news/economy/indicators/how-heat-waves-could-scorch-differentsectors-and-melt-indias-gdp-growth/articleshow/99609273.cms>
- <https://www.thenationalnews.com/business/economy/2022/05/09/how-indias-economy-is-feelingthe-heat-from-climate-change/>



EXPLORING THE VIBRANT WORLD OF MULLICK BAZAR FLOWER MARKET

Moutuli Das

Class of 2024

Mullick Bazar Flower Market, located in the bustling city of Kolkata, West Bengal, is a heaven for flower enthusiasts and a spectacle for the senses. Mullick Ghat is a 130 year old flower market, the largest in Kolkata, and one of the biggest in Asia. Nestled in the heart of the city, this vibrant market has been a hub for flower traders, florists, and visitors for decades. With its myriad colours, fragrances, and bustling activity, Mullick Bazar Flower Market offers a unique experience that showcases the beauty of nature and the cultural heritage of the region.



A Historical Perspective

Mullick Bazar Flower Market traces its root back to the colonial era when the British introduced formalized floriculture in Kolkata. The market, which came into existence during the early 19th century, rapidly gained prominence due to its strategic location near the Howrah Railway Station. It is also located right next to the famous Jagannath Ghat, a heritage place for its European architecture style. It was constructed in 1760 by an Indian. Initially, it served as a hub for sourcing flowers for the grand festivals and ceremonies held in the city.

Over the years, the market expanded and became a center for both wholesale and retail trades. Today, it attracts traders from different parts of the country, offering an extensive range of flowers, plants, and associated accessories. The market's historical significance, combined with its vibrant atmosphere, has made it a popular tourist destination and a beloved spot among locals.

A Symphony of Colors and Fragrances

Walking through the narrow lanes of Mullick Bazar Flower Market, one is immediately captivated by the kaleidoscope of colors and the mesmerizing aromas that fill the air. The market is a treasure trove of blossoms, with a wide variety of roses, marigolds, orchids, jasmine, lilies, and more. The

vibrant hues and delicate petals create a sensory feast, attracting customers who seek to adorn their homes, temples, and special occasions with these natural wonders. This market is an amazing sensory experience

The market is divided into different sections, each dedicated to a specific category of flowers. From garland makers meticulously threading blooms together to florists arranging bouquets with artistic precision, the market buzzes with activity. Traders expertly negotiate prices, while customers immerse themselves in the process of selecting the perfect flowers.

Beyond the Blooms

Mullick Bazar Flower Market is not just about flowers; it is a microcosm of a larger ecosystem. As you navigate the labyrinthine alleys, you will encounter sellers offering an array of items such as decorative ribbons, incense sticks, religious artifacts, and even exotic birds. The market also supports a network of small-scale businesses, including tea stalls and snack vendors, where visitors can take a moment to relax and savor the vibrant ambience.

The market's cultural significance is particularly evident during festivals like Durga Puja and Diwali, when the demand for flowers reaches its peak. During these times, the market comes alive with an unparalleled fervor, as it becomes the go-to destination for both locals and tourists seeking to partake in the festive spirit.

Mullick Bazar Flower Market is not just a commercial space; it is a testament to the resilience of tradition in the face of changing times. While modernization has brought new challenges to the market, it continues to thrive, adapting to the needs of its customers while preserving its age-old customs.

Visiting the market offers a glimpse into the lives of the people who work there, their stories woven into the fabric of Kolkata's history. It is a place where generations of families have traded and established their livelihoods, passing down their expertise and knowledge from one generation to the next.



THE 'CLEANEST' SECRET OF MEGHALAYA!

Riyanka Saha

Class of 2025

THE VILLAGE OF MAWLYNNONG

Nestled in the East Khasi Hills district of the Meghalaya state in North East India, the cleanest village in India, Mawlynnong village is also an eco-friendly village that stands as a testament to the harmonious coexistence of man and nature. The place took its name from the Khasi words “maw”, meaning stone, and 'lynnong', meaning 'scattered'. Mawlynnong is scattered large rocks that have natural hollows in them. They were carved by flowing water at some time in the remote past. It is also known as “God's Own Garden” and for all the right reasons. In 2003, Mawlynnong was awarded the title of the '**cleanest village in Asia**' by *Discover India* magazine. Alongside cleanliness, the village has achieved a lot - be it a high percentage of literacy rate, or a women empowerment scenario that the rest of the world can just only dream of!



Location of Mawlynnong village

Not being dirty seems an odd reason for fame, but this condition is enough of a rarity especially when the entire nation is still struggling to put forward effective steps towards a Clean India, this small village has already proved that with a strong determination, a goal is half achieved. Through the misty mountain roads, 90 km from Shillong, along the India-Bangladesh border, a narrow corridor through the wall of green, with broomstick plantation on both sides, the small village opens the gates of its heart to welcomes the world outside.

Mawlynnong is mainly inhabited by the Khasi tribe, the famous tribe which has left behind the patriarchal rule of the society. In the matrilineal society here, the man shifts to the woman's house after marriage, the children of the family get their mother's surname, and the wealth is passed down from the mother to the youngest daughter of the family. The population is mostly Christian and the village has three churches.

The literacy rate is 90 per cent. Pretty progressive! Agriculture is the chief occupation of the local population, with betel nut being the main crop. During summers, one can find litchis and pineapples, which are then exported to the nearby regions as well.

Having a clean and beautiful environment to offer, it is believed that the village has reached a milestone for atleast a decade now. It all started with the outbreak of cholera some 130 years ago. The village is dotted with traditional thatched-roof houses, each surrounded by vibrant gardens adorned with colourful flowers. Mawlynnong has a rigorous recycling program, non-existent in most of India. The residents of Mawlynnong have ingeniously repurposed discarded materials into art, creating beautiful handicrafts that are a testament to their creativity and commitment to recycling.

For people here, cleanliness is not a habit but a way of living. It is all because of this that the village reports no cases of malaria or dengue, diseases that afflict much of India. Sitting at 5,000 feet altitude helps defeat mosquito-borne diseases. All houses here have had functional toilets since 2007. There are bamboo dustbins all over the village from where the waste is directed to a pit and then used as manure. Even the dry leaves fallen from the trees go straight into the dustbin. The use of polythene bags is banned, and smoking is prohibited. The rules are strictly followed and the defaulters are charged heavily. A community initiative enforces the participation of the residents of the village in rainwater harvesting. People not only clean their houses, but they step out to sweep the roads every Saturday and planting trees is a part of their lifestyle too.



Use of eco-friendly dustbins for cleaning the village

Close to Mawlynnong is a bridge across a busy mountain stream built by intertwining the roots of a living rubber tree. It is one of two that are known to tourists, but residents claim there are hundreds. An American traveller, Patrick Rogers, who has trekked through the interiors of the state to map these bridges after becoming fascinated by what he calls "some of the world's most unique architecture", documented the existence of 88 of these remarkable structures. The **Nohwet Living Root Bridges** in Mawlynnong have been declared a UNESCO World Heritage Site.

The panoramic view from the sky viewpoint, 85 feet high, perched atop a bamboo structure offers a breathtaking vista of the waterfall in Mawlynnong and the neighbouring landscape of Bangladesh. Adding to it is the Church of Epiphany, built in 1902, which reflects a fusion of European and Khasi architecture. The premises look soothing with a lot of greenery and patches of red and orange flowers blossoming around it.

The weather in Mawlynnong is pleasant all through the year. Still, the best time to visit this picturesque hamlet is monsoon. The best part about the food you eat in Mawlynnong is that all of it is prepared using organically grown vegetables. Even the meat comes from in-house-bred birds and

animals. There is a wide variety of vegetarian and non-vegetarian dishes to savour; pick from pork tossed in bell peppers and greens, freshly-cut and smoked banana-flower, Jadoh – a meat and rice-based delight, and Tungrymbai – a sumptuous mesh of fermented soybeans, bamboo leaves, and local spices.

In Mawlynnong, one can find some nice homestays that are traditionally built huts, while a few are built from concrete. In Mawlynnong accommodation is simple, and comes with basic facilities. However, Mawlynnong's growing notoriety has led to a construction boom. Villagers are building more guest houses and are expanding a parking lot to keep up with the influx of tourists. It is concerning that the rapid construction and use of non-traditional designs and building materials will dilute the village's charm and authenticity.

In short, a visit to Mawlynnong is not just a journey; it is an odyssey into a world where cleanliness, sustainability, and cultural richness converge seamlessly. Visiting Mawlynnong feels like stepping into a pristine oasis which lives and breathes “cleanliness is next to godliness”. The journey to this idyllic village will take you through lush green landscapes and winding roads, setting the stage for the tranquillity that awaits. Amidst the grey pollution engulfing our India, Mawlynnong is a patch of oxygen that stands as an inspiration for communities worldwide!

BIBLIOGRAPHY :

- <https://traveltriangle.com>
- <https://en.m.wikipedia.org>
- <https://www.meghalayatourism.in>

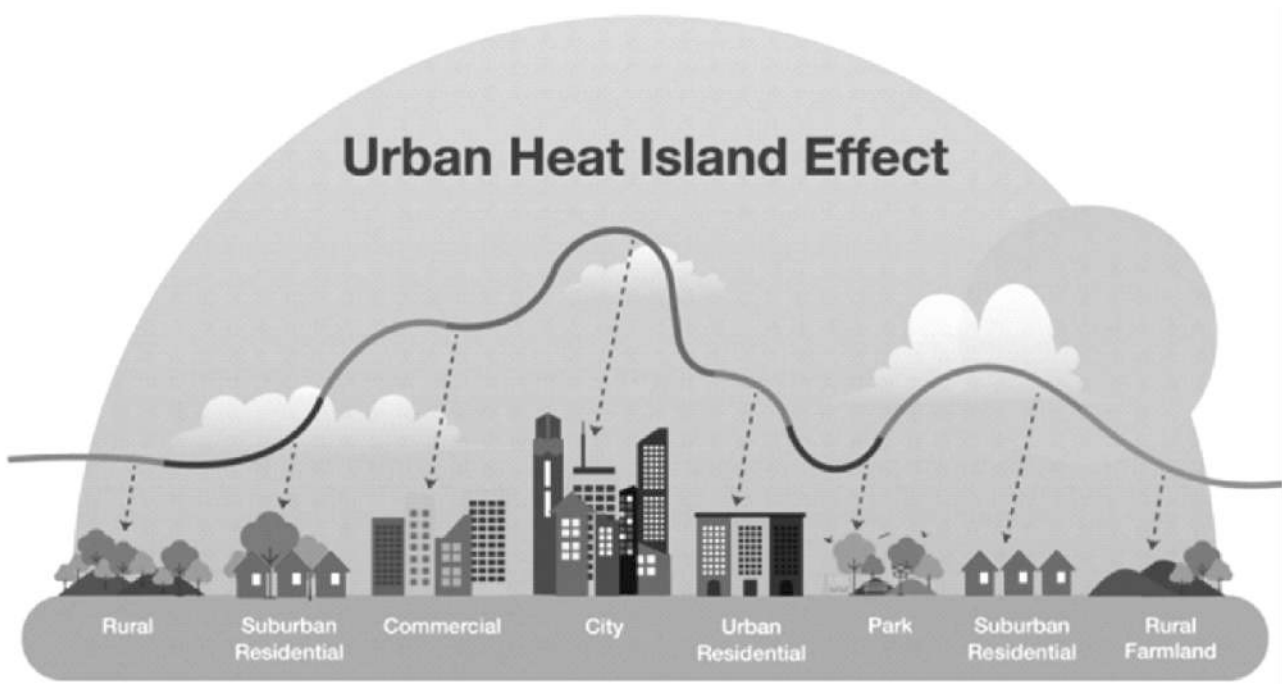


UNDERSTANDING THE URBAN HEAT ISLAND EFFECT : A GROWING CHALLENGE FOR CITIES

Moutuli Das

Class of 2024

As urbanization continues to shape our cities, an alarming phenomenon known as the Urban Heat Island (UHI) effect has emerged. This phenomenon refers to the significant temperature difference between urban areas and their surrounding rural environments. The UHI effect poses a range of challenges, including compromised public health, increased energy consumption, and environmental degradation. In this article, we will delve into the causes, impacts, and potential solutions to mitigate the Urban Heat Island effect.



Causes of the Urban Heat Island Effect

Multiple factors contribute to the development of the UHI effect. One primary cause is the replacement of natural surfaces such as vegetation and soil with impervious materials like concrete and asphalt. These materials absorb and re-radiate heat, elevating urban temperatures. Additionally, the concentration of buildings and infrastructure in urban areas generates heat through various activities, including industrial processes, transportation, and air conditioning.

Impacts of the Urban Heat Island Effect

The UHI effect has wide-ranging impacts on both the environment and human health. Increased temperatures can exacerbate air pollution, as the chemical reactions leading to smog formation are accelerated in warmer conditions. Heat-related illnesses and fatalities become more common during heatwaves, particularly among vulnerable populations such as the elderly and those with pre-existing health conditions. Furthermore, the elevated energy demand for cooling buildings during hot periods strains power grids, leading to blackouts and higher carbon emissions from power generation.

Mitigation Strategies

Cities around the world are implementing various strategies to combat the Urban Heat Island effect. Urban greening initiatives play a vital role in reducing temperatures and enhancing urban resilience. Planting trees and creating green spaces not only provide shade but also facilitate evapotranspiration, a process by which plants release moisture into the atmosphere, cooling their surroundings. Green roofs and walls are another effective way to enhance urban cooling, reducing heat absorption and improving energy efficiency. Strategic urban planning can also contribute to mitigating the UHI effect. Implementing zoning regulations that prioritize green infrastructure and open spaces helps maintain natural ventilation corridors. Utilizing cool materials in construction, such as reflective roofs and pavements, minimizes heat absorption. Additionally, incorporating sustainable drainage systems and water bodies can assist in cooling the environment by evaporative cooling. Lastly, community engagement and public awareness are crucial for the success of UHI mitigation efforts. Encouraging residents to adopt heat-reducing practices like rooftop gardens or white roofs, promoting energy-efficient building designs, and advocating for sustainable transportation options can contribute to a cooler and more resilient urban environment.

The Urban Heat Island effect poses a significant challenge for cities worldwide. As urbanization continues unabated, it is imperative for policymakers, urban planners, and communities to prioritize strategies that mitigate the UHI effect. By investing in urban greening, incorporating sustainable materials, and fostering community engagement, cities can create cooler, healthier, and more sustainable urban environments. Addressing the UHI effect is not only vital for the well-being of city dwellers but also essential in the fight against climate change and its adverse impacts.



THE ESPLANADE MARKET, KOLKATA – A SAGA OF DESIRABILITY WITH AFFORDABILITY

Ishani Roy

Class of 2024

Besides being the *City of Joy* Kolkata is often considered as the “cultural capital” of India. Located at the eastern bank of the River Hooghly, it holds within it rich ancient cultural heritage. During the early colonial period Kolkata (then called Calcutta) was the capital of British India. It reflects a blend of modernity as well as rich ancient culture and architecture. The colonial architecture of Kolkata is a mix of styles from different periods of the city's history. It is a blend of European and Indian style. The earliest buildings in the city were constructed by the British during their rule, and were in the neoclassical style. These include the Old Fort William, the Writers' Building, and the General Post Office among many others.

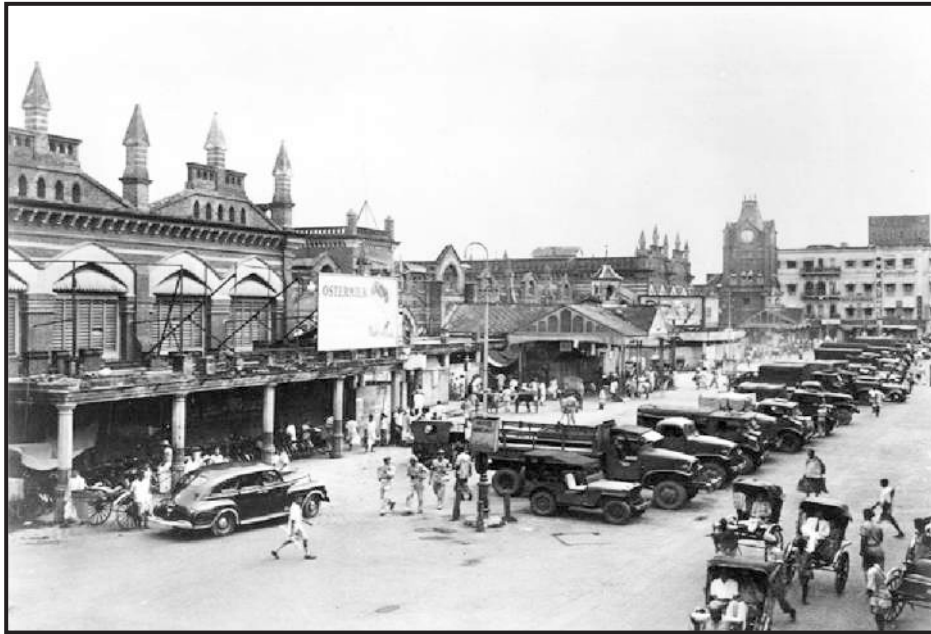
Spread over an area of 206.08 square kilometres the city is also famous for some the finest and the cheapest market places. One such place is the *Esplanade Market Place* located at the centre of the district Kolkata.

History of Esplanade Market

British colonists had long wanted a separate shopping facility from the longstanding Indian bazaars to avoid mixing with the “natives.” Sir Stuart Hogg, the then Chairman of Calcutta Corporation initiated the project which was funded by the Calcutta Corporation. Twenty-eight years later on December 2, 1903, the market was officially named Sir Stuart Hogg Market and later as Hogg Market.



After independence the market was called New Market. Led by Sir Stuart Hogg the old Fenwick Bazar at the location was purchased and razed to pave way for the New Market [1]. R.R. Bayne, an East Indian Railway Company architect, laid the plans for a sprawling Victorian Gothic shopping complex that drew the attention and admiration of the European settlers from all over the sub-continent. The red wall, white arched windows, and a gorgeous clock tower which arrived from Huddersfield in the 1930s were declarative of the Gothic façade in the middle of Calcutta (Kolkata).



<https://www.itinari.com/new-market-the-microcosm-of-kolkata-mf8v>

Advantageous Prime Location

Located at the heart of the city the New Market has an excellent connectivity with other places. Its prime central location provides a good network accessibility to nearly all parts of the District. The central location allows good bus facilities which connect almost the entire District. The Esplanade bus terminus and various other bus stands around are there for inter-city, inter-district and inter-state transportation. This proves to be advantageous for the public who travel daily from the periphery of the city to the core. Earlier also trams used to run on a daily basis (the first tram in Calcutta ran from Esplanade) in the area. Apart from the roads the most used mode of transportation is the underground metro railway. The first Kolkata metro line ran to Esplanade.

Hub of Necessary, Desirable and Affordable Goods

Ranging from very expensive goods to moderately priced to cheap goods, one can find anything and almost everything here. Located at the heart of the city with a bustling vibrant and variety-filled atmosphere along with a busy cheering ambience the New Market is still the first choice for many articles for the city people. The shops keep up with continuous modernization and adaptation of new trends and culture offering a variety of products. Starting from daily needed goods, sportswear, inner wears, shoes, stationeries, to accessories cosmetics etc. are all found in one place. The wet market, flower market, grocery and fruit markets as also the food corners are particularly popular.

Lets Make Fashion a Therapy

Together with communication, development is transforming how people live. In addition to necessities, they seek out trendy products. The idea that "styling is an art" is much sought after in this competitive age of fashion. Shops selling oxidised accessories and metal jewellery with the newest styles of anklets, chokers, and earrings make New Market the most well-known shopping destination. This area is home to a number of well-known retail centres, such as City Mart, Big Bazaar, and several other shoe and bag businesses.

Additionally, there are small shops where one can purchase clothing, purses, and daily necessities. However, this is not the last. There are also great food corners here. Everything is conveniently close by, from tea or coffee to pizza, burgers, noodles, and Indian food. Thus the market offers a wide range of options and is appealing to different generations.



NOIDA – THE EMERGING SILICON VALLEY OF NORTH INDIA

Sakshi Rai

Class of 2024



New Okhla Industrial Development Authority (NOIDA) has come a long way since its inception. Forty years back, when Noida was established, no one had imagined that it would become one of the fastest-growing cities and would take the economy of Uttar Pradesh to the next level.

With clean roads, high-speed metros, and big corporates, Noida has become the IT hub for large & small enterprises.

Noida is a satellite city of Delhi and is a part of the National Capital Region (NCR) of India. The city with a favourable climate and infrastructure has attracted major industrial leaders and software giants to establish their permanent base in the city. Noida, along with Greater Noida, has generated a total of 87% jobs in Uttar Pradesh state. Software Technology Park is the main attraction in Noida that has captivated the interest of developers.

Proximity to the National Capital

The most significant reason for the progress of Noida is the proximity to the National Capital, New Delhi. The connectivity with New Delhi has made it even easier for NOIDA to represent itself for the national capital. The development and progress in the city have fulfilled the necessity of decentralization of the industries and opportunities of New Delhi.



The Delhi-Noida Direct Flyway (DND (flyway)



Noida's Aqua line Metro

Noida : The New IT Hub

The new IT Hub has actually ignited many progressive aspects for the city. The geographical position has also facilitated the IT industry in the city. Noida now homes plenty of multinational companies. There are 1676 tech startups in Noida. Noida sector 62 (the Tech hub of the city) is a hub for many technology companies such as IBM, TCS, Accenture, Nokia, Ericsson, Arm Holdings, Samsung and Barclays. These companies are contributing to the city's economy with their software product development and service export in foreign currencies. As per few available resources, Noida, in terms of IT professionals, is the most populated city.

Recently, Microsoft announced to set up a new hub in Noida to hire the country's quality engineering talent. This will further act as an attraction for software developers to Noida. Paytm, India's largest unicorn fintech company is also headquartered in Noida.

The increasing job opportunities have attracted people to the city, and the urban infrastructure has boomed in recent years to supply the demands.



IT Parks of Noida

The IT Parks of Noida totally appear as a different world of their own than the rest of the city. The well-known IT Parks of Noida are:

- DLF IT PARK
- LOGIX INFOTECH PARK
- STELLAR IT PARK
- EMBASSY GALAXY BUSINESS PARK
- LOGIX TECHNO PARK

NOIDA is all set to emerge as a new IT hub of North India. Apart from IT and electronics, Noida and Greater Noida are also emerging as a big hub for data centres. Multinational giants like Microsoft, US's MAQ Software and Adani Group have plots of land to set up data centres.

Manufacturing Units

Noida alone has attracted over ninety handset manufacturing units. Companies such as Oppo, Vivo, Samsung and Lava are some of the electronics majors that have set up large mobile

manufacturing units in the region and are expanding further. The government subsequently declared Noida, Greater Noida and Yamuna Expressway areas as 'Electronics Manufacturing Zones' to further boost investments in the region, given the increased interest from companies. The Greater Noida area has received investments worth Rs 26,530 crore in the past four and a half years. These investments have created jobs for 71,500 people, in which 40% local youth are also getting employment in 391 factories.

NOIDA- Home to India's Leading GIS Software and Solutions Providerid-to-end Geographic

Since 1996, ESRI has been leading various initiatives in the industry resulting in growth and adoption of GIS technology solutions by government, businesses, academia and NGOs in India. Esri



India Technologies Ltd, with its head-office in NOIDA is an end-to-end Geospatial Information Systems (GIS) solutions provider. It has enabled the customers to think and plan geographically to make timely and well-informed decisions. Esri with its leading product, ArcGIS provides the backbone for the country's mapping, spatial analysis and all other GIS requirements. A market leader in GIS Technologies, Esri India has successfully delivered cutting-edge GIS solutions.

Thus, with the tag of one of the cleanest cities, and it's astounding infrastructure, Noida has enrolled itself amongst the smartest and highest capital income cities. The Noida Authority is among the richest civic bodies in the country and Noida is classified as a Special Economic Zone (SEZ). Positioned at the doorstep of New Delhi, we can say that Noida city not only serves merely as a satellite city, but it is all set to achieve a self-identity as a Tech-Hub, proving itself as "The emerging Silicon Valley of North India".



WRAPPED WOES : NAVIGATING THE PITFALLS OF PROCESSED AND PACKAGED FOODS

Abantika Roy

Class of 2025

In today's fast-paced world, convenience often outweighs nutritional value, leading to the widespread consumption of processed foods. However, behind their smart packaging lies a concerning truth – processed foods can have severe detrimental effects on human health worldwide. In an era marked by convenience and efficiency, processed foods have become ubiquitous in our diets which are offering quick and easy solutions to the demands of modern life. Over the past years, consumption of processed food has surged due to various factors like urbanization, industrialization, changing lifestyles and smart packaging by food corporation companies. Daily, we consume more calories, but our intake of protein and fibre remains low, which negatively impacts our physical and mental health.

The Rise of Processed Foods

In recent years, India has witnessed a notable shift in dietary patterns, characterized by an increasing reliance on processed foods also became a hub of heart diseases, diabetes now it has become the cancer capital of the world. So, with this concern, we must channel our eating system in a good way. Processed foods encompass many products, from sugary snacks and savoury treats to pre-packaged meals and convenience foods. While they offer convenience and affordability, their nutritional value often pales in comparison to whole, unprocessed food. First and foremost they are laden with high sugar, sodium and fats. Excessive sugar consumption, for instance, has been linked to the development of type 2 diabetes, obesity, and cardiovascular diseases. Similarly, the consumption of Trans fats, commonly found in processed snacks and baked goods, raises levels of LDL cholesterol while lowering HDL cholesterol,

SHIFT OF CONSUMERS :

With increasing disposable incomes and exposure to global cuisines through media and travel, Indian consumers are increasingly drawn to processed foods that promise convenience, taste, and variety. Ready-to-eat meals, packaged snacks, instant noodles, and carbonated beverages have gained popularity, particularly among busy urban dwellers and the burgeoning middle class. In Indian households we usually choose fewer protein foods like cornflakes(Kellogg's) which has 17.2g of sugar, chocolate has 60.5g, protein drinks like Bourn Vita has 78g of sugar, jam (Nissan) which has 130.7g etc. Our body needs 0.8grams of protein per kg of body weight daily but we somehow fail to manage that intake. Nowadays we prefer fast foods to homemade foods. For example, refined grains, commonly found in processed bread and cereals, lack nutritional value. Recently Bourn Vita has announced that it is not a health drink published by THE TIMES OF INDIA. India is now the biggest importer of palm oil which results in 50 per cent of heart attacks happening in Indians below 50 years as consumption of packed foods and processed foods as palm oil is 49% saturated fat. The refining process used to produce palm oil products can generate harmful byproducts such as trans fats, which have been linked to adverse health effects, including inflammation, insulin resistance, and an increased risk of chronic diseases. Many food brands currently use palm oil in higher amounts than before. Consumption of soft drinks also leads to an increase in obesity and diabetes According to

researchers, consumption of soft drinks is likely to increase the chances of a person getting obese by 1.6 times. Soda has also been known to affect the kidneys. Those with high phosphoric acid content have been known to increase renal colic, especially in men. There are many commonly used brands in India which are rich in refined oil, sugar, refined flour, palm oil and saturated fats like Lays, Haldiram products, Pringles, Kurkure, Kinder Joy, Frooti etc.

“Having awareness is undeniably crucial for our safety and wellbeing. By being mindful of our surroundings and the people around us, we can proactively avoid potential dangers and ensure our security.”

1. Getting food curriculum at the school level
2. Read ingredient labels: before purchasing any processed food items. Look for palm oil, palm kernel oil or refined flour in the list. They should be avoided
3. Choose whole foods: opt for whole foods whenever possible. Fresh foods, vegetables, whole grains, nuts, lean proteins.
4. Select products with alternative ingredients: seek out those packaged foods that use alternative oils like olive oil, coconut oil or sunflower oil instead of palm oil. Similarly choose a product that is made with whole grains like wheat, oats brown rice etc.
5. Cook meals from scratch so you can control the amount of nutrients in your foods.

CONCLUSION

Packaged foods and processed food are a double-edged sword offering convenience while poisoning our health slowly. The excessive levels of additives, preservatives, salt, sugar, and palm oil, contribute to various health issues such as obesity, cardiovascular, diabetes etc. Moreover, the loss of nutrients during processing further their nutritional value decreases compared to whole foods. However not all processed foods are unhealthy, some undergo minimal changes. It's high time for us to be mindful of our choices, prioritise health by choosing whole foods whenever possible, be aware of ingredients contents and make informed decisions. A striking balance should be maintained between convenience and nutrition to maintain a healthy lifestyle in today's fast-paced world.

BIBLIOGRAPHY :

- <https://www.bartleby.com>
- <https://nursinganswers.net>
- <https://www.medicalnewstodays.com>



UNLOCKING THE MYSTERIES OF THE GEOLOGICAL WONDERS OF LADAKH

Aditi Majhi

Class of 2025



Ladakh, heaven on earth. I love travel but Ladakh trip was just above all emotions. Being a traveller traveling to Ladakh is to experience a beautiful environment up close and for a geography student it is just to observe a place read in the pages of a book. I never thought I would see a clear picture of this mountainous plateau from the sky. A magical geographical place where mountains, dry cold deserts and cool salty lakes can be found together.

Ladakh lies between 32° to 36° north latitude and 75° to 80° east longitude. It is the highest flat terrain of the Indian state of Kashmir with many of it being over 3,000m. The total area of 45110sq km makes Ladakh the biggest district in India. This place is home to rich Tibetan culture

Every place of Ladakh attracted me. But the three most attractive places for me are Magnetic hill, Pangong lake and Moon land.

Magnetic Hill :

Nestled within the awe-inspiring landscape of Ladakh lies a phenomenon that challenges the conventional laws of gravity - the enigmatic Magnetic Hill. This natural wonder has intrigued travellers and scientists alike, drawing them to its mystical embrace. Let us embark on a journey to uncover the secrets of Ladakh's Magnetic Hill, where reality blurs and gravity seems to bend.

Location :

Situated on the Leh-Kargil-Batalik national highway, about 30 kilometres from Leh, the capital of Ladakh in the northernmost region of India, Magnetic Hill commands attention with its magnetic allure. Amidst the barren, rugged terrain of Ladakh, this spot stands out, inviting visitors to witness its extraordinary phenomenon. The surrounding landscape, with its stark beauty and serene ambiance, provides the perfect backdrop for this natural marvel.

Geological explanation :

In Ladakh's Magnetic Hill, the appearance of vehicles rolling uphill is an optical illusion caused by

a combination of magnetic forces and the layout of the terrain. Gravity still pulls objects downhill, but the strong magnetic field in the area creates a perceptual trick that makes it seem like gravity is working oppositely.

Furthermore, geological studies suggest the presence of naturally occurring magnetic minerals in the ground, like magnetite. These minerals create a strong magnetic field in the area, which, combined with the unique topography, creates an optical illusion where objects appear to move uphill when they're actually moving downhill.



Conclusion :

Ladakh's Magnetic Hill stands as a testament to the wonders of nature, captivating all who venture to witness its inexplicable magic. While science may unravel the mysteries behind its phenomenon, the allure and fascination it evokes remain undiminished.

Pangong lake –

In the remote reaches of the Himalayas, nestled between India and Tibet, lies a shimmering jewel of nature – Pangong Lake. Renowned for its mesmerizing beauty and captivating allure, this high-altitude lake holds within its depths a geological narrative that spans millions of years.

Formation : A Tale of Tectonic Forces and Glacial Erosion

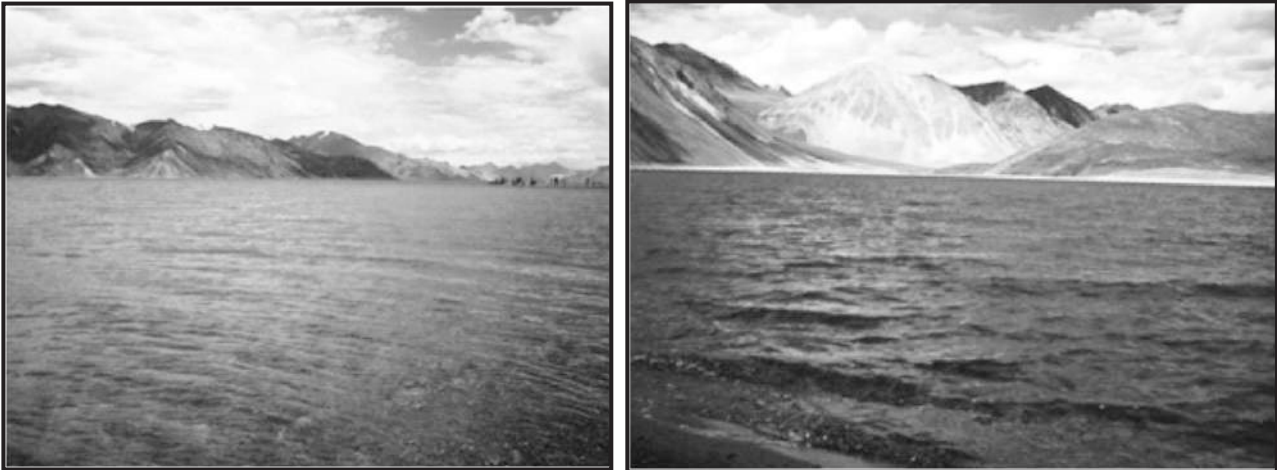
Pangong Lake owes its existence to the dynamic forces that have sculpted the landscape over millennia. The lake's origins can be traced back to the collision of the Indian and Eurasian tectonic plates, a process that began around 50 million years ago.

But the geological saga didn't end there. During the Pleistocene epoch, which lasted from about 2.6 million to 11,700 years ago, vast glaciers blanketed the region, carving deep valleys and shaping the landscape. Pangong Lake, with its azure waters stretching over 134 kilometers in length, is a testament to the erosive power of these ancient ice sheets. As glaciers retreated, they left behind a network of interconnected valleys, one of which became the basin for Pangong Lake.

Unique Geological Features : Layers of Sedimentary History

Beyond its striking beauty, Pangong Lake harbors a treasure trove of geological wonders waiting to be discovered. The surrounding mountain sides bear witness to millions of years of geological activity, with layers of sedimentary rocks offering glimpses into the Earth's tumultuous past. From limestone to shale, these rock formations provide valuable insights into ancient environments and the processes that shaped them.

One of the most notable geological features of Pangong Lake is the salinity of Pangong Lake, unlike freshwater lakes, stems from its endorheic nature, meaning it has no outlet to the ocean. The lake collects water from surrounding streams, rivers, and precipitation but lacks a natural drainage system to release excess water. As water evaporates due to the high altitude and arid climate of the region, it leaves behind dissolved salts and minerals, gradually increasing the salinity of the lake. Over time, this process has led to the accumulation of salts, resulting in Pangong Lake's distinctive saline composition.



Conclusion –

Through responsible tourism practices and environmental conservation efforts, we can ensure that Pangong remains a testament to the Earth's extraordinary geological history and a source of inspiration for all who behold its beauty.

And the last one wonder is Moonland –

Start from Leh, the capital of Ladakh, head west on the Leh-Kargil highway (NH1), after about 30 kilometers, you'll start to notice the landscape changing dramatically to a barren, rocky terrain. Keep driving along the highway, and you'll pass through various breathtaking vistas resembling the moon's surface. Moon land is a surreal geological wonder nestled in the heart of the Indian Himalayas.

The characteristics features of this landscape –

The landscape is characterized by barren, undulating terrain with unique geological formations that closely resemble the rugged and desolate features of the lunar landscape. The Moonland of Kargil owes its unique appearance to the intricate process of erosion that has unfolded over millions of years. The region's soft, sedimentary rocks, primarily composed of clay and shale, have been sculpted by the elements into a mesmerizing labyrinth of narrow ridges, deep gorges, and undulating valleys. The result is a landscape that appears otherworldly, with its stark, lunar-like features stretching as far as the eye can see.

Despite its harsh and inhospitable environment, Kargil's Moonland is not devoid of life. Hardy desert vegetation, adapted to the extreme conditions, manages to eke out an existence amidst the rocky terrain. Rare and resilient species of flora and fauna have adapted to thrive in this harsh environment, adding a touch of vibrancy to an otherwise desolate landscape.



Conclusion

So it is a captivating landscape that blends natural beauty, cultural heritage, and spiritual significance. Its rugged terrain, high-altitude deserts, and ancient monasteries create a unique and unforgettable experience for visitors, reflecting the harmony between humanity and the environment.

BIBLIOGRAPHY :

Wikipedia - <https://en.wikipedia.org/wiki/Lamayouro>

Pictures : self clicked



IN NAYA MAUZA, PASCHIM MEDINIPUR, WEST BENGAL, THE NATURAL SETTING INFLUENCES THE SOCIO-ECONOMIC LIFE OF PEOPLE

Class of 2024

An excursion is a necessary component of the curriculum for studying Geography. It is usually programmed for studying geography outside the traditional classrooms, where the students visualise and achieve the original knowledge of places and works that they have learned in the books and gain the knowledge of observation, evaluation, data collection and so on mainly for educational purposes. The fundamental purpose of the excursion is to open up an observational analysis for educational and non-experimental research and provide the students with experiences outside their everyday activities, such as camping with teachers and their classmates, collecting the samples and finally gaining a clearer concept by interrelating them with their textbook knowledge.

Introduction

The Geography Department of Shri Shikshayatan College arranged an excursion to Naya village in Pingla Block, Paschim Medinipur District, West Bengal from 14th March to 16th March 2023. On 14th March, a group of 50 students along with two professors left for the excursion by bus following NH-12 and then NH-16 and reached Kolaghat. From Kolaghat, the team took the NH-16 and then a major metalled road called Dakbungalow-Moyna Road and reached Naya Pattachitra Village. The total distance covered was approximately 103 kms.



Study area

A special feature of the study area is that it is inhabited by skilled painters or Chitrakars of Patachitra scroll painting and these activities dominate the cultural landscape of the Patachitra Village as it is called. This feature attracts the attention of tourists from various parts of the State as well as from outside. The Department of Micro, Small and Medium Enterprises, Govt. of West Bengal, in collaboration with UNESCO, has developed a hub of Patachitra at Naya village. Chitrakars' painting appliances are essentially basic. Even to create the canvas, they still use ingredients from nature. Painting brushes are made from the roots of the Keya plants. The colours used are all-natural colours obtained either from vegetative matter or from natural stones.



Our group

Objectives

To establish the connection between the folk art form of West Bengal as a valid design tool or as a design exemplar. This paper also focuses on how the simple art form, from its manufacturing process to the final costume design and the silent folk setup can help in other design industries and design processes. And to assess the relationship between the physical setting and the livelihood of painters of the Naya village.

Material and Methods Adopted



Dumpy level survey

The study was conducted through a survey in the target village; a brainstorming session with the active artisans; and a discussion with artisans about motifs of their creation, myth, tools and technology used and problems faced by craftsmen regarding maintaining their livelihood.

Land use survey was conducted in the village. Naya village, comprises 277 houses. A dumpy level survey was conducted to determine the height and distance of various surveying locations. Soil samples were collected from different land. As the Patachitratr addition of Nayaartisans has not been enlightened till now, no secondary data have been gathered. As tales of the art forms, myth behind the paintings and details of procurement of colours are being handed over from generation to generation, only verbally, their knowledge should be properly conserved before the extinction of the inside stories. During the present study, four generations of the Chitrakar community of Naya village including a few women artists were interviewed for collection of first-hand

data. A list of dye-yielding plants in the local area has been documented along with their bioprospecting to sustain livelihood.

Observations

Geologically, the district Paschim Medinipur shows two zones such as :

- (i) a western sector covered by old crystalline rocks and,
- (ii) an eastern sector covered by recent alluvium of Upper Pleistocene to Holocene age.

Pleistocene laterites are found on the highest levels in the west. Elsewhere older alluvium is found. Holocene deltaic silt is found as floodplain deposits; sand is found in active channels. Clay is also found as marsh deposits. The elevation of land varies from 5 m to 115 m. The elevation of the study area is about 13 m. The average slope of the land in the district is 80. Land slopes from west-north-west to east-southeast.

The rivers of Paschim Medinipur District, emerge from the Chhotanagpur Plateau to the west, flow to the east or south-east ward direction following the slope of the land and finally either meet the Bay of Bengal to the south-east or join the Hugli River as its tributary. All the rivers in this region are rain-fed and are in spate during monsoon. The rivers include Shilabati, Kangsabati and Subarnarekha and their tributaries. There are many hand pumps found in the Naya village which function throughout the year. There are several river basins, and irrigation project command areas in the district.

The district has oppressive hot summers and high relative humidity almost year-round. The winter season runs roughly from the middle of November to the beginning of February. March through May is considered the warm season May is the hottest month. The highest temperature may occasionally approach 47°C. January is the coldest month. Periods of cold weather with low temperatures of up to 5°C can occur in the winter. Relative humidity is generally high throughout the year. From January to April, humidity is below 50% in the afternoons.



Soil samples

According to the agro-ecological sub-regions Paschim Medinipur falls under sub-regions 15.1 and 12.3. The soil texture in the Naya village is clay. The samples collected from different land uses in the village show that the soil is primarily alkaline.

Paschim Medinipur District falls under the Western Forest Circle of West Bengal. On average 60% area is covered with Sal and the rest is covered with plantations, scrub jungles and bushes. As per the Forest Survey of India, 2019 assessment, it was found that out of 2161.54 sq. km of forested area, open forest has the largest cover. The Pattachitra makers depend entirely on natural sources including vegetation for the

colours they use in making the pattachitra. This is how their entire life and livelihood are related to the physical surroundings, particularly vegetation.

The State of West Bengal with its conducive climate, rich resources and diverse geophysical characteristics has nurtured various crafts. These crafts remained the primary economic factors and occupation for the clusters in which they bloomed and retained their identity. 'Patachitra' remains one such craft, whose identity is regional and unique in its expression.

We ran a survey on 130 houses in Naya village. We observed that there are two major types of houses, kutcha houses and pucca houses. We found that more people live in the pucca houses than in kutcha houses, which shows the slow and steady development in the village. The houses have roof materials that are mainly of cement, asbestos, and tin.

The flooring in the village is primarily composed of a mixture of mud and cement. It has been observed that 98% of the houses in the village have access to electricity. Furthermore, most of the houses have a sewerage connection. Good ventilation is present in 90 houses, whereas 18 houses only have medium ventilation. Lastly, the majority of houses have a proper water supply, with only a few lacking access to it.

There is a small percentage of the population that enjoys good health conditions, while a larger portion has a moderate health status. Unfortunately, due to a lack of financial resources, people living in the area are unable to obtain higher education. Research indicates that approximately 65% of the population have received primary education, 25% have received secondary education, 9% have completed higher secondary education, 4% have graduated from college, and only 1% are uneducated.

Colours and raw materials used in Pattachitra painting :

The materials used in 'Pattachitra' are mostly sourced locally due to economic reasons. The colours used in this art form are derived from natural sources and are still mostly made from various elements found in nature. This is why the colours used in 'Pattachitra' retain the palette of earth or natural colours. Black is obtained from soot, white from Kusum Mati or a special clay made from white stones, blue from Aparajita flower, red from teak or saffron or Pan (betel)/Khayer (catechu), green from Kundri or Barbati (runner bean) leaves, yellow from turmeric, and brown from matured leaves of teak.



Black is obtained from soot



The colours are of organic origin, they are eco-friendly as well.

Composition of Visitors and Art Themes

The visitors to Naya village can be broadly classified into two categories – art dealers and tourists. These visitors have a direct impact on the art themes of the 'Chitrakars' of the village. Approximately 80% of visitors are tourists while the remaining 20% are art dealers who visit the village annually. Through centuries, these art forms have served as an effective platform where contemporary myths, lore, tales, audio-visual narratives, political and religious messages and music are being integrated to depict mythological, socio-cultural, political and stories of nature. (Fig. 1)

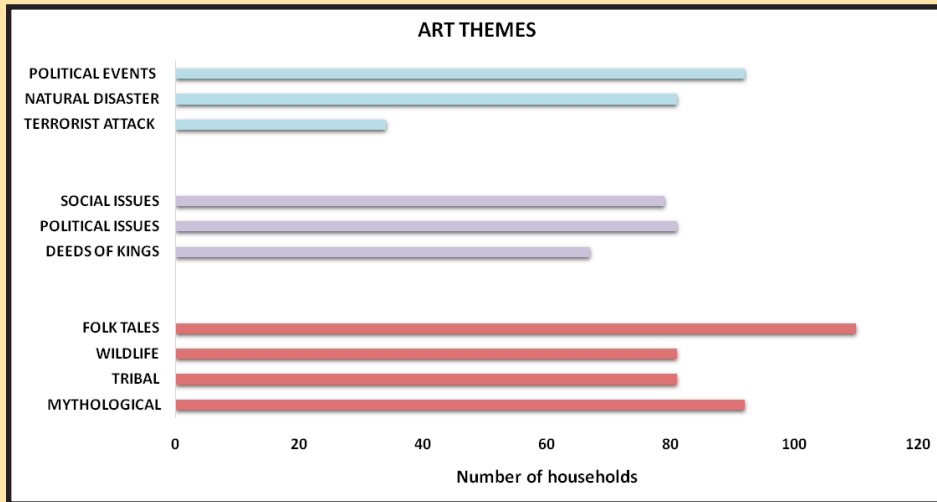


Fig. 1

Challenges faced by the Patua community

Upon inquiry, we discovered that a significant problem faced by the people in this region is the lack of education. About 68% of the population is affected by this issue, followed by scarcity of raw materials (15%), financial constraints (10%), and lastly, difficulties in selling their products and natural disasters (7%). The Patuas face several challenges, including weak financial power and inability to obtain bank loans, lack of literacy among artisans, and the absence of an organized marketing process.

They reported several occupational health issues. (Fig. 2)

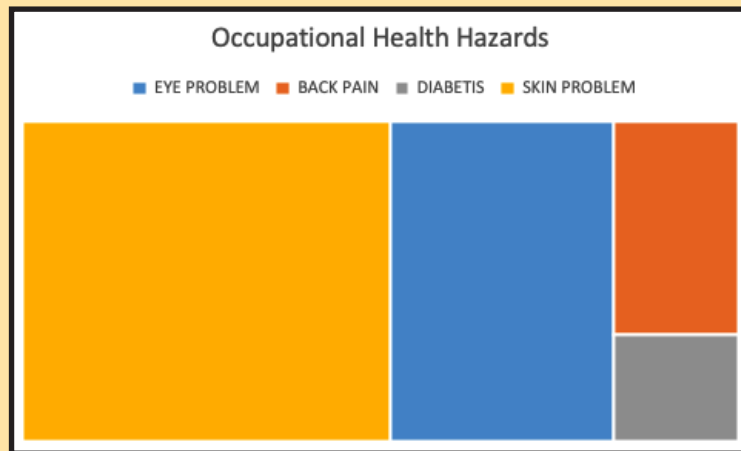


Fig. 2

CONCLUSION

The village of Naya was identified by the Government of West Bengal under the Rural Craft Hub (RCH) project. The dwellings in Naya grew out of what we call folk architecture into a settlement of contemporary buildings using modern materials, an impact of exposure to urban areas. However, within 5 years from 2013, with the right support and governmental intervention, Naya village revived into a craft community of 350 artists today with the economy boost enough to garner global recognition, a GI on their craft form and pride in their settlement and their 'Pattachitra' exhibited in the National Museum of Ethnology, Lisbon. This has been reflected in the way they infused their art form and the essence of their craft in their modernistic habitat (Fig. 3) as well as the retention of the traditional spaces, the entire region now emerging as a craft village, visually rich in the aesthetics of their legacy.



Fig. 3



Exhibitions

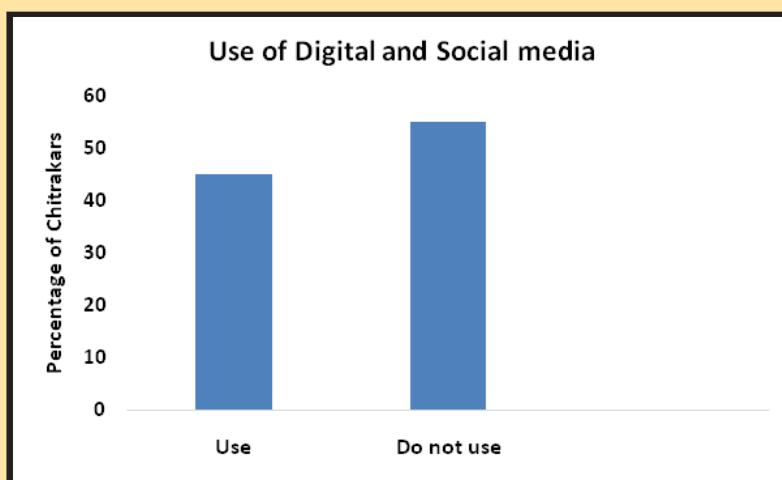


Fig. 4

Now a day Chitrakars are using various social media and digital methods (Fig. 4) to spread their artwork worldwide.

Acknowledgement

The field report was completed under the guidance of Dr. Susmita Sen and Dr. Jayati Das, for which the students are grateful.

BIBLIOGRAPHY :

1. Ansari, Shah Nawaz, 'Socio-economic Aspect of Artisans in India in 20th Century', International Journal of Humanities and Religion, www.humanitiesjournal.info Online ISSN : 2319-5630, February, 2014.
2. Bhowmick, Atul Chandra, 'The Indigenous Art form of the Patuas of West Bengal' in Midya, Dipak Kumar (ed.), Indigenous People in India, Delhi, 2012.
3. Chatterjee, R. 2009. Global events and local narratives : 9/11 and the picture storytellers of Bengal. Indian Folklore Research Journal 9: 1-26.
4. Datt, R. & Sundharam K.P.M., Indian Economy, New Delhi, 1986.
5. Department of Micro & Small Scale Enterprises & Textiles, Government of West Bengal: Craft Hubs of West Bengal.
6. District Census Handbook, 2011
7. District Planning Map Series (DPMS) 2005,2011
8. District Survey Report 2020,2022
9. Dutta, Gurusaday, Folk Arts and Crafts of Bengal : The Collected Papers, Seagull, Calcutta, 1990.
10. Forest Survey of India (FSI), 2019.
11. Human Development Report (HDR), 2020-21
12. India Council for Agricultural Research (ICAR), 1992.
13. India Meteorological Department (IMD), 2008.
14. Korom, Frank J., 'Civil Ritual, NGOs, and Rural Mobilization in Medinipur District, West Bengal', Asian Ethnology, Volume 70, Number 2- 2011.
15. National Atlas and Thematic Mapping Organisation (NATMO), 2006
16. Sen Gupta, Amitabh. Scroll Paintings of Bengal: Art in the Village. Bloomington: Author House, 2021
17. Sengupta, Sankar (ed), The Patas and Patuas of Bengal, Calcutta, 1973.
18. Siva, R. 2007. Status of natural dyes and dye-yielding plants in India. Curr. Sci.92 (7) : 916-925.
19. <https://expresstrainroute.com>
20. <https://www.google.com>



PHOTO ALBUM OF DEPARTMENTAL ACTIVITIES



ANNUAL EXCURSION – PINGLA



WORLD METEOROLOGICAL DAY CELEBRATION



EARTH DAY CELEBRATION



CAREER COUNSELLING BY ALUMNI



EARTH DAY CELEBRATION



DRONE SURVEY WORKSHOP



GIS DAY – POSTER COMPETITION



QUIZ CONTEST

