CLIMATE ACTION IN INDIAN CITIES

Special Coverage on Climate Action in 5 cities from Rajasthan & Maharashtra

Research Study

2022-23

Regional Centre for Urban & Environmental Studies
All India Institute of Local Self-Government, Mumbai
Established in the year 1968, is fully supported by Ministry of Housing and Urban Affairs, Government of India

PREFACE

Cities are critical to climate change because they are home to more than half of the world's population, and they account for over 70% of global greenhouse gas emissions. As centers of economic and social activity, cities have a significant impact on the environment, contributing to climate change through energy consumption, transportation, waste management, and urban sprawl. Cities are particularly vulnerable to the impacts of climate change, such as sea-level rise, flooding, heat waves, and droughts, due to their high population density and infrastructure concentration.

Climate change action at the city level is also necessary because cities have the potential to implement policies and projects that can reduce greenhouse gas emissions and increase resilience to climate impacts at a more localized and targeted level, making it easier to achieve tangible results and engage with communities. Urban local bodies (ULBs) face significant challenges in managing and integrating the data required for climate action commitments. Major challenges include lack of knowledge of financial resources, limited technical expertise, and limited knowledge of interlinking data making it a daunting process. In order to overcome this problem, we planned to provide support to the ULBs by guiding them on adopting, managing, and integrating the data for the city's climate action commitments, thereby reducing the burden and easing the work toward the implementation of climate action.

The research aimed to showcase the climate action efforts undertaken in five cities across India, specifically two in Rajasthan (Ajmer, Jodhpur) and three in Maharashtra (Solapur, Sangli, and Nanded). The selection of cities was based on their alignment with the Regional Centre for Urban and Environmental Studies (RCUES), Mumbai, their inclusion in national programs, and schemes, their vulnerability to climate risk, their aspiration to take climate action, and also, considering their lack of knowledge on reporting of climate action. The study utilized various sources such as research and analysis from available resources, on-site visits, and inputs from Municipal Corporation officials to collect information. The initiatives taken by the selected cities were compared against the National Action Plan on Climate Change (NAPCC), National Determined Contributions (NDCs), Sustainable Development Goals (SDGs), and different government schemes and are grouped into sectors based on the common initiatives that align to multiple objectives for providing guidance to the ULBs. The book also includes case studies that highlight best practices adopted by other cities in India.

The report's findings and best practices can be used to guide other ULBs in managing and integrating the data required for climate action commitments, thereby supporting the implementation of effective climate action at the city level.

ACKNOWLEDGEMENT

I take this opportunity to put on record our deep appreciation for the Ministry of Housing & Urban Affairs (MoHUA), Government of India (GoI) for providing us an opportunity to working on this study.
I would also like to express my gratitude to Shri. Ranjit Chavan, President, All India Institute of Local Self Government, for providing invaluable guidance and support to help us complete this report. Additionally, I extend my sincere thanks to Dr. Jairaj Phatak, IAS (Retd.), Director General, All India Institute of Local Self Government, for his unwavering support in completing this report.
This research study was undertaken by Cipher Environmental Solutions LLP, Thane in collaboration with RCUES, AIILSG, Mumbai. I truly appreciate the sincere efforts of Dr. Ketna Matkar, Director of Cipher Environmental Solutions LLP, Thane, Mr. Kartik Matkar, and Ms. Anuja Pimplapure, Project Associates at Cipher Environmental Solutions LLP, Thane in completing the book on best practices titled “Climate Action in Indian Cities: Special Coverage on Climate Action in 5 Cities from Rajasthan & Maharashtra” which has been additionally prepared besides report as a part of the project. The team played a significant role in the field research to record the best practices in the cities and provide insightful recommendations for the book as well as the report. The efforts would help in reducing the burden of the urban local bodies and help in facilitating climate action.
I am also grateful to RCUES's research team for their continued support throughout the completion of this study. Together, we have produced a report to guide the cities to make them more resilient to climate change through the implementation of climate action.

Director
RCUES, AIILSG, Mumbai

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ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AMC	Ajmer Municipal Corporation
AGWRS	Artificial Ground Water Recharge Scheme
BLY	Bachat Lamp Yojana
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CSCAF	Climate Smart Cities Assessment Framework
GIM	National Mission for Green India
IPDS	Integrated Power Development Scheme
IWLDP	Integrated Waste Land Development Programme
IWMP	Integrated Watershed Management Programme
JMC	Jodhpur Municipal Corporation
NCAP	National Clean Air Programme
NHM	National Health Mission
NAM	National Afforestation Mission
NAP	National Agricultural Policy
NBP	National Bioenergy Programme
NGHM	The National Green Highways Mission
NMEEE	National Mission for Enhanced Energy Efficiency
NMSA	National Mission for Sustainable Agriculture
NMSH	National Mission on Sustainable Habitat
NMSHE	National Mission for Sustaining the Himalayan Ecosystem
NMSKCC	National Mission on Strategic Knowledge for Climate Change
NSM	National Solar Mission
NWM	National Water Mission
PAT	Perform, Achieve and Trade
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana

ABBREVIATIONS

PMKUSUM	Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan
PMMSY	Pradhan Mantri Matsya Sampada Yojana
R-APDRP	Restructured Accelerated Power Development and Reforms Programme
RDF	Refuse Derived Fuel
SBM-U	Swachh Bharat Mission-Urban
SLNP	Street Lighting National Programme
SMAF	Sub-Mission on Agroforestry
UDAY	Ujwal DISCOM Assurance Yojana
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
UJALA	Unnat Jyoti by Affordable LEDs for All
LAHDC	Ladakh Autonomous Hill Development Council
STP	Sewage Treatment Plant
SWM	Solid Waste Management
C & D	Construction & Demolition
FSTP	Faecal Sludge Treatment Plant

INTRODUCTION

Climate change is one of the most pressing global challenges of our time, and cities play a significant role in mitigating its impacts. With the increasing frequency and intensity of natural disasters, rising sea levels, and extreme weather events, cities need to take swift actions to reduce their carbon footprint and promote sustainable development. This report presents a compilation of the best practices of cities in the category of climate action, focusing on initiatives related to solid waste management, renewable energy, green spaces, and sustainable transportation.

METHODOLOGY

The report provides information about the best practices on climate action from across the nation with primary focus on the following areas: Energy Conservation, Renewable Energy, Water Conservation, Waste Management. The information gathered was collected through research & analysis from available resources. The report also provides information of climate action initiatives of five cities in India: Ajmer, Jodhpur, Solapur, Sangli, and Nanded. The information from these cities was obtained through site visit and as per the information provided by the Municipal Corporation officials.

It was observed that most of the cities are finding it difficult to align their city level initiatives with the SDGs, NDCs, NAPCC & Schemes & Programs

DISTINCT FEATURE

The initiatives from selected 5 cities were evaluated based on their alignment with the Sustainable Development Goals (SDGs), National Determined Contributions (NDCs), National Action Plan on Climate Change (NAPCC), and various government schemes.

SECTOR WISE CLIMATE ACTION THEMES

Overview of Initiatives at City Level

The five cities have implemented initiatives related to solid waste management, renewable energy, green cover, conservation of energy, water conservation, and sustainable transportation that align with the SDGs, NDCs, NAPCC, and various government schemes. The initiatives can serve as a guideline for other cities looking to take climate action and promote sustainable development.

- SUSTAINABLE TRANSPORTATION
- WASTE MANAGEMENT
- POLLUTION CONTROL
- WATER BODY CLEANING
- WATER CONSERVATION
- GREEN COVER
- ENERGY CONSERVATION
- RENEWABLE ENERGY

SUSTAINABLE TRANSPORTATION

Sustainable transport or non-motorized transport refers to modes of transportation that do not rely on fossil fuels or motorized vehicles, such as walking, cycling, and public transportation powered by clean energy sources. This type of transport is essential in mitigating climate change, reducing greenhouse gas emissions, and improving air quality in urban areas. It can also alleviate traffic congestion and reduce reliance on fossil fuels.

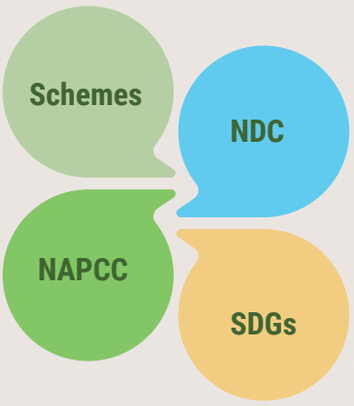
Interlinkages

Race to Zero

AMRUT, Smart Cities Mission,National Electric Mobility Mission, PMGSY, UIDSSMT, National Urban Transport Policy

Pragathipath Yojana, Garib Samriddhi Yojana, Aapno Taluko Vibrant Taluko

NMSH



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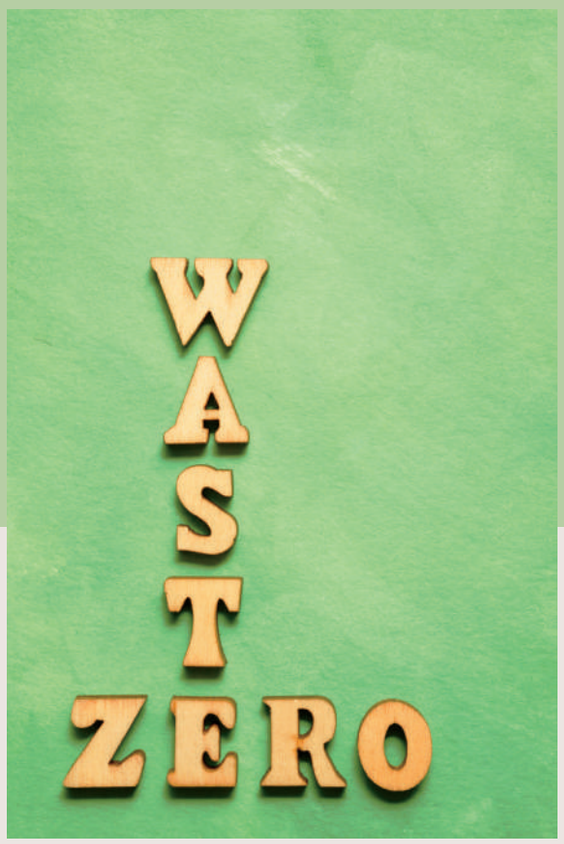
9, 11, 17

WASTE MANAGEMENT

Sustainable waste management is crucial in fighting climate change. Traditional waste disposal methods such as landfills and incineration can emit greenhouse gases like methane & carbon dioxide that contribute to climate change. By implementing sustainable waste management practices like recycling, composting, and energy recovery, the amount of waste sent to landfills and incinerators can be reduced, leading to lower GHG emissions. This can also help conserve natural resources, reduce pollution, & promote circular economy principles.



Interlinkages

Schemes

Race to Zero, Race to Resilience
SBM-U, Integrated Waste Land Development Programme, Sustainable Alternative Towards Affordable Transportation (SATAT), Steel Scrap Recycling Policy, GOBAR-DHAN Scheme
Majhi Vasundhara Abhiyan, Nirmal Gujarat Yojana, Garib Samriddhi Yojana, Aapno Taluko Vibrant Taluko

NDC

1, 2, 3, 7, 8

NAPCC

NMSH

SDGs

11, 12, 17

POLLUTION CONTROL

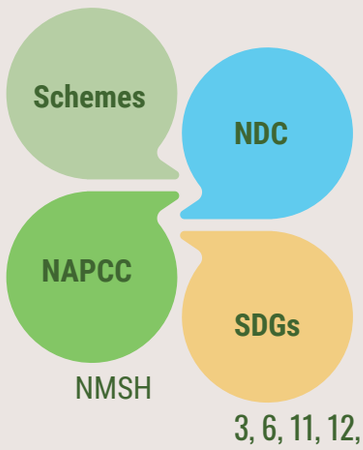
Solid waste management, wastewater treatment, and particulate emissions control measures can help mitigate climate change. Poor management of solid waste and wastewater can release greenhouse gases, including methane, into the atmosphere, while particulate emissions contribute to air pollution, which can also impact climate change. Proper management of solid waste and wastewater can reduce emissions and even generate renewable energy, while controlling particulate emissions can improve air quality and mitigate the impact of climate change.

Interlinkages

Race to Zero, Race to Resilience

NCAP, PMKSY, AMRUT, SBM-U, Voluntary Vehicle-fleet Modernisation Programme, Steel Scrap Recycling Policy, Namami Gange Programme

Majhi Vasundhara Abhiyan



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NMSH

3, 6, 11, 12, 17

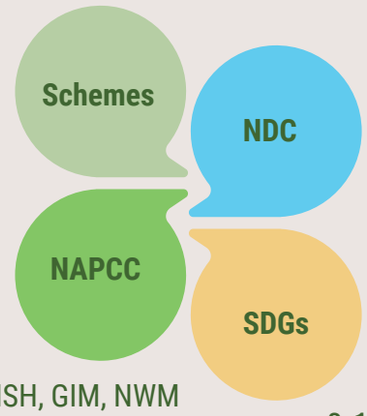
WATER BODY CLEANING

Restoring and cleaning water bodies like lakes, rivers, wells, & ponds can help in mitigating climate change in multiple ways. Healthy water bodies can reduce the amount of carbon dioxide in the atmosphere by storing carbon. Restoration can improve biodiversity & ecosystem health, which can help in carbon sequestration. Also, water bodies can reduce the urban heat island effect and the need for energy for cooling. Overall, cleaning can improve water quality and availability

Interlinkages

AMRUT, PMKSY, SBM-U, IWLDP, Jal Shakti Abhiyan, Namami Gange Programme, Mahatma Gandhi National Rural Employment Guarantee Act

Majhi Vasundhara Abhiyan, Nital Goem Nital Baim



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NMSH, GIM, NWM

6, 14, 15, 17

WATER CONSERVATION

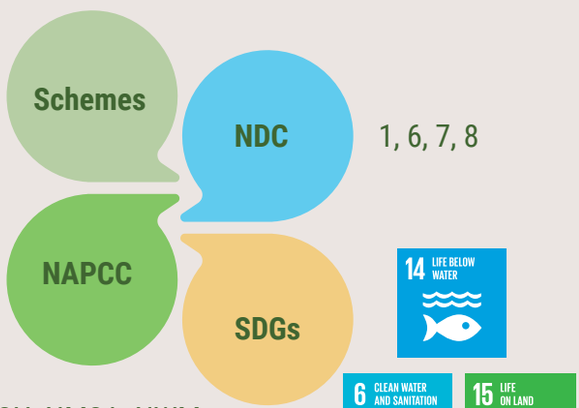
Water conservation can help in reducing the energy needed for water treatment, pumping, & transportation. This can be achieved by implementing various measures like reducing water usage, using water-efficient appliances & fixtures, promoting water reuse and recycling, RWH, & repairing water leaks. Furthermore, protecting and restoring natural water sources such as wetlands & watersheds can help in water conservation & mitigating the effects of climate change on water resources.

Interlinkages

Race to Resilience

AMRUT, IWMP, Jal Jeevan Mission, PMKSY, Rajiv Gandhi National Drinking Water Mission, PMMSY, Jal Shakti Abhiyan, Namami Gange Programme, Atal Bhujal Yojana, National Project on Aquifer Management, Mahatma Gandhi National Rural Employment Guarantee Act

Jalswarajya- II Program, Majhi Vasundhara Abhiyan, Shivkalin Pani Sathawan Yojana, SUJALA Suphalam Yojana, Garib Samriddhi Yojana



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NMSH, NMSA, NWM

6, 14, 15

GREEN COVER

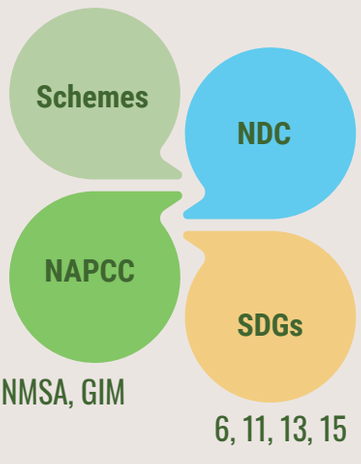
Forests and large-scale tree planting areas play a crucial role in fighting the climate crisis by absorbing carbon dioxide from the atmosphere. They act as 'carbon sinks' and can sequester twice as much CO_2 as they emit. Similarly, parks, green spaces, and waterways are crucial public spaces in cities that offer solutions to the negative impacts of unsustainable urbanization on health and well-being.

Interlinkages

Race to Zero, Race to Resilience

AMRUT, CAMPA, Smart Cities Mission, NAP, National Bamboo Mission, SMAF, NGHM

Majhi Vasundhara Abhiyan, Krishi Aranya Protsaha Yojane, Samrudha Hasiru Grama Yojane



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NMSH, NMSA, GIM

6, 11, 13, 15

ENERGY CONSERVATION

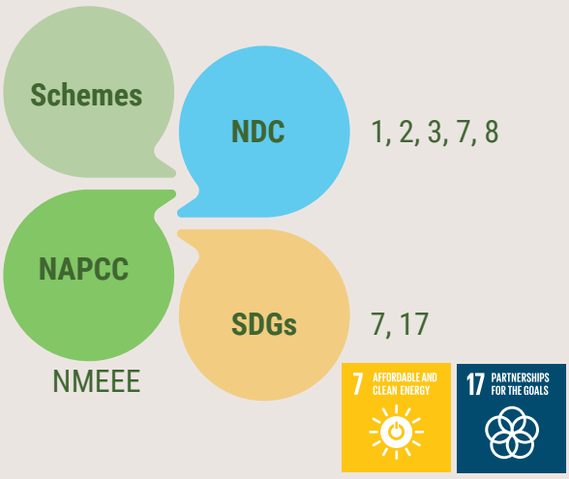
Employing energy-saving measures like LED lighting and transitioning to electric vehicles can aid in mitigating climate change by reducing the reliance on fossil fuels, which are significant contributors to greenhouse gas emissions. Besides, measures like adopting to public transportation, improving building insulation, using energy-efficient appliances, renewable energy sources can help reduce energy consumption, GHG emissions, & air pollution while promoting sustainability and economic development.

Interlinkages

Race to Zero, Race to Resilience

BLY, PAT, R-APDRP, SLNP, UDAY, UJALA,Green Hydrogen Policy, 100% EV Declaration, Energy Conservation Act, Steel Scrap Recycling Policy, Pradhan Mantri Sahaj Bijli Har Ghar Yojana-Saubhagya, ECO Niwas Samhita, Municipal Energy Efficiency Programme, National Smart Grid Mission

Kisan Hit Urja Shakti Yojana, Bal Urja Rakshak Dal, Jyotirmay Scheme, Urja Kerala Mission



RENEWABLE ENERGY

Renewable energy sources like solar can play a significant role in mitigating climate change. They offer several benefits, including reduced greenhouse gas emissions, improved air quality, increased energy independence, & job creation in the renewable energy sector. Solar energy, in particular, is a versatile & abundant source of renewable energy that can be harnessed to power homes, businesses, & even entire communities. By transitioning to renewable energy sources we can reduce our dependence on fossil fuels & lower carbon footprint.

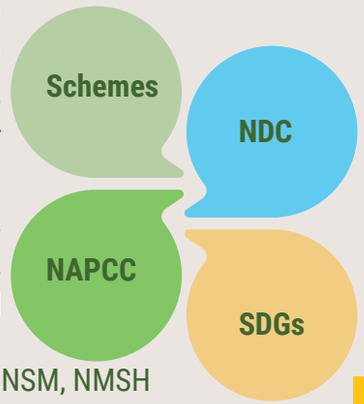
Interlinkages

Race to Zero, Race to Resilience

PMKUSUM, UDAY, IPDS, Green Hydrogen Policy, 100% EV Declaration, National Clean Energy Fund, Green Energy Corridor Project, National Smart Grid Mission, Mission Solar Charkha

Majhi Vasundhara Abhiyan, Surya Raitha Scheme, Urja Kerala Mission, Bal Urja Rakshak Dal

NMEEE, NSM, NMSH



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CLIMATE ACTION IN INDIAN CITIES

Special Coverage on Climate Action in 5 cities from Rajasthan & Maharashtra

Best Practices

Rajasthan
Jodhpur & Ajmer

Maharashtra
Solapur, Sangli & Nanded

RAJASTHAN

Rajasthan is the largest state in India and makes up 10.4% of the total land area. It is sparsely populated and is situated in the northwest of the country between 23°30' and 30°11'N latitudes and 69°29' and 78°17'E longitudes, The State is home to the Thar Desert and the Aravalli Mountain ranges. Rajasthan is divided into two climatic zones by the Aravalli Range, with the eastern region being semi-arid to sub-humid and the western region being arid to semi-arid. Both of these climatic zones are marked by extreme temperatures, protracted droughts, high wind speeds, and high potential evapotranspiration.

Rajasthan, with an average annual precipitation of just 572 millimeters, is one of India's most water-scarce states. Based on hydrogeological factors, groundwater availability varies widely, and the quality of deeper levels of groundwater is low. Rajasthan's scarce groundwater resources are being used more and more for domestic, commercial, and agricultural reasons, including irrigation. Rajasthan is vulnerable because over 75% of the population relies on climate-sensitive industries like agriculture, animal husbandry, and forestry. Rajasthan's high climate sensitivity causes severe and frequent periods of drought. Rajasthan also has the least capacity for adaptation.

JODHPUR

Jodhpur, known as "Suncity," is the second largest town in Rajasthan State and a cultural heritage city of western Rajasthan. The city, over 540 years old, has a unique medieval rainwater harvesting and water management system, allowing it to survive in an arid desert climate with frequent droughts. It is located at Latitude: 26°16'6.28"N & Longitude: 73°0'21.38"E and has an elevation of 235 meters. Bounded by hills in the north and west, Jodhpur has a hot desert climate with long, extremely hot summers and mild to warm winters, where temperatures range from 25°C to 41°C. The city receives minimal rainfall with an average annual precipitation of only 300-400 mm. Climate change is predicted to have significant impacts on Jodhpur, including increased temperatures and reduced water availability. The city already faces water scarcity problems, and climate change is expected to worsen this situation. Extreme weather events such as heatwaves and droughts are likely to become more common and intense.

CLIMATE ACTION

SUSTAINABLE TRANSPORTATION
Footpath

WASTE MANAGEMENT
Composting

WATER CONSERVATION
Step well

GREEN COVER
Public Gardens/ Parks
Roadside Plantation

ENERGY CONSERVATION
Street Lights-LED, Solar
Green Building

RENEWABLE ENERGY
Rooftop Solar Panels-JMC Building

SUSTAINABLE TRANSPORTATION

Mandore Road

Well-designed footpaths can encourage people to walk or cycle instead of driving, reducing greenhouse gas emissions from transportation. To combat climate change, it is crucial to have improved and increased infrastructure for walking and cycling in cities. These modes of transportation offer an appealing alternative to motorized vehicles, as they are a dependable and low-cost option when other means of transportation are not available.

The city has got extensive construction of footpaths, which has helped in reducing the dust and improving the air quality.

WASTE MANAGEMENT

Reuse Old Tyres-JMC Office

Old tyres are painted and creatively designed to create unique and attractive decorative elements for building. Reusing old tyres helps to reduce the amount of waste going to landfills and the environmental impact of tire disposal.

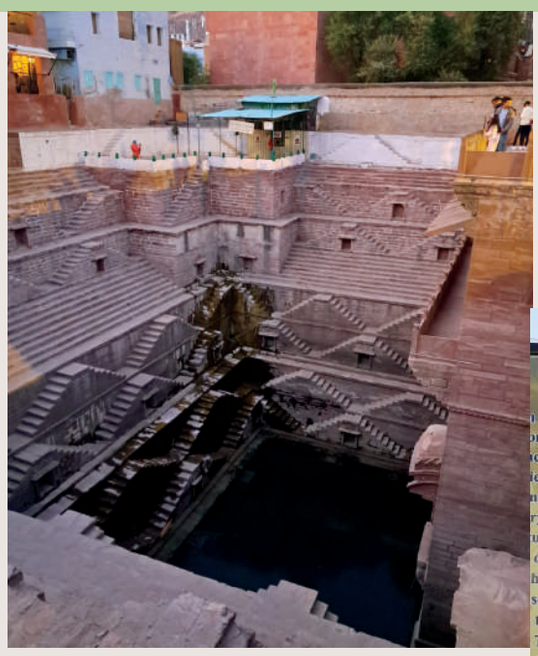
WASTE MANAGEMENT
Composting-Unmed Udyan

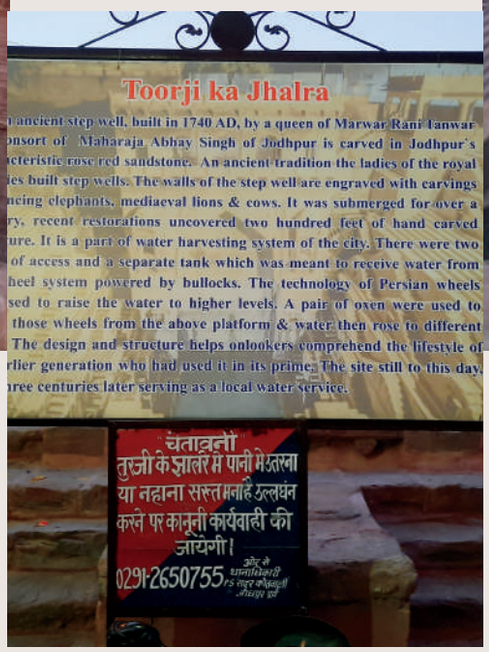
The biodegradable garden waste is collected from the Unmed Udyan and is composted by aerated method using specially designed cemented bins. Composting garden litter is a simple and effective way to reduce waste, improve soil health, and support a healthy ecosystem. Having decentralized composting units set up in gardens/ parks itself helps to reduce the amount of organic waste that ends up in landfills, which otherwise would break down and also lead to release of harmful methane gas.

WATER CONSERVATION

Toorji Ka Jhalra

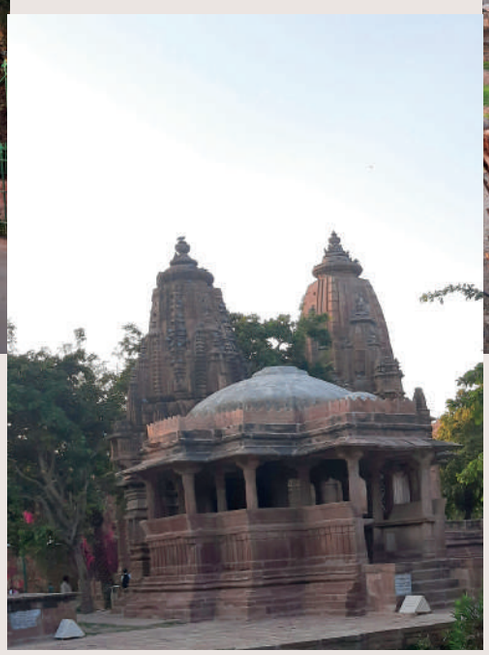
The renowned jhalra, constructed with the renowned rose-red sandstone of Jodhpur, is a 250-year-old structure that remains one of the few representations of Jodhpur's conventional water management systems. The jhalra has been submerged in deep water for decades, but restoration efforts have brought this unparalleled heritage to light, revealing a 200-foot-deep structure. The Ghatu of Jodhpur was sculpted from red stone with exceptional artistry, demonstrating the precision of the engineering. To drain the water, channels in the shape of cows and lions were chiseled. The Persian wheel technology was used to lift the water to higher levels, and a couple of oxen were used to turn the wheels from a platform above, raising the water to two different levels.

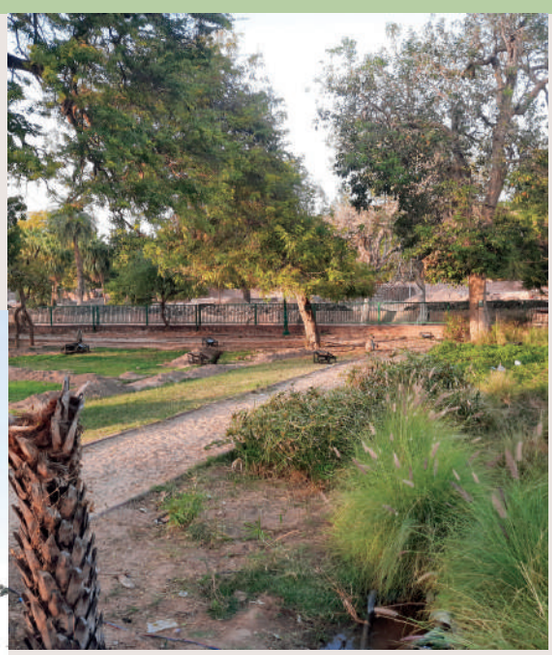




GREEN COVER
Mandore Garden

Mandore Garden is being maintained as a green space for the public and beautification enhancement of the garden is done through fountains & ponds. Improving the quantity and quality of green areas can aid in mitigating the effects of short-lived climate pollutants, which cause a substantial impact on global warming. Additionally, urban features such as fountains, ponds, lakes, and rooftop gardens can help in reducing the Urban Heat Island effect and regulating extreme temperatures, which can lead to energy savings and better climatic conditions in urban areas.





GREEN COVER

Paota Road-Vertical Green Wall

Green spaces such as parks and gardens can help in reducing heat buildup in urban areas. Due to limited ground space and high cost, vertical gardens like green facades and walls provide a solution to increase greenery in cities. These green facades also offer benefits to commercial and residential buildings, as they provide shade and absorb heat

ENERGY CONSERVATION

Street Light-LED

LEDs are considered energy-efficient since they produce minimal heat, which means they consume less energy to produce the same amount of light compared to their traditional counterparts. In contrast, incandescent bulbs lose 90% of their energy as heat, while fluorescent lights lose about 80% of their energy as heat. By using LED lights, energy conservation can be achieved since they are 40 to 60% more energy efficient than conventional lighting technologies. Also, the emissions generated by LED street lights are very less as compared to the other conventional equivalents.

ENERGY CONSERVATION

Green Building-ICICI Bank (RISETI)

ICICI's Rural Self Employment Training Institute (ICICI RSETI), Jodhpur, is a building which was 'Net Zero Energy - Platinum' rated by the Indian Green Building Council (IGBC). Key features that enhance the sustainability of the building include less water consumption, energy optimization, conservation of natural resources, less waste generation and provision of healthier spaces for its occupants. Consumption of water and electricity is lower by 50% compared to conventional buildings.

RENEWABLE ENERGY

Jodhpur Municipal Corporation office

The Jodhpur Municipal Corporation office has installed Rooftop Solar Panels in the office building. This has helped to substantially reduce the expenditure on electricity and in reducing the carbon footprint. Overall, rooftop solar panels are a sustainable and cost-effective way to generate electricity, reduce energy bills, and contribute to efforts to combat climate change.

AJMER

Ajmer district is located in the central part of Rajasthan, at a latitude of 26.4499° N and the longitude of 74.6399° . It is bounded by Nagaur district to the north, Bhilwara district to the south, Tonk and Jaipur to the east, and Pali district to the west. It falls in agro-climatic zone III ‘A’ semi-arid-eastern plain zone and has a semi-arid climate with extreme weather conditions, including hot-dry summers and cold-bracing winters. The average rainfall is 525 mm, with 25-30 rainy days in a year. Ajmer is vulnerable to the impacts of climate change, experiencing changes in temperature, rainfall, and extreme weather events such as droughts and floods. The city's vulnerability to climate change is influenced by factors such as location, water resources, and population density. Ajmer is also susceptible to natural hazards like earthquakes, which can be worsened by climate change.

CLIMATE ACTION

SUSTAINABLE TRANSPORTATION

Cycling Track
Footpath

WASTE MANAGEMENT

Plastic Waste Collection & Co-processing
Composting

POLLUTION CONTROL

Wastewater treatment & Reuse of treated waste water

WATER BODY CLEANING

De-Weeding of Lake

WATER CONSERVATION

Wet land conservation

GREEN COVER

Public Gardens/ Parks
Lakefront Development

ENERGY CONSERVATION

Street Lights-LED
E-Vehicles

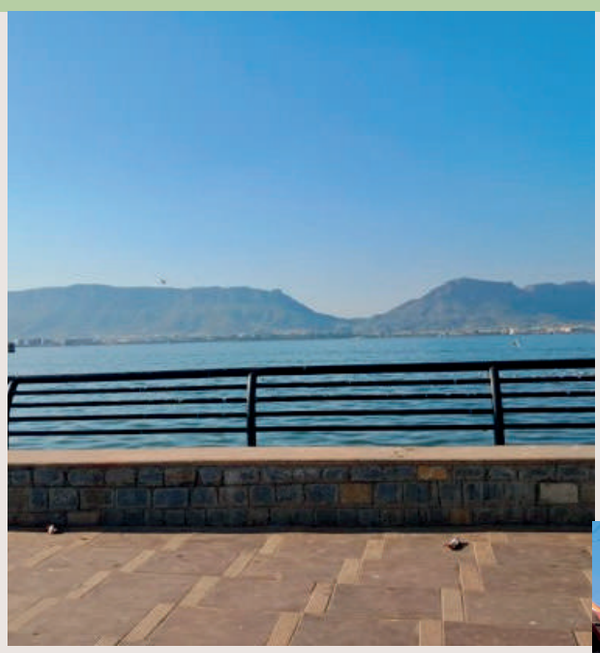
RENEWABLE ENERGY

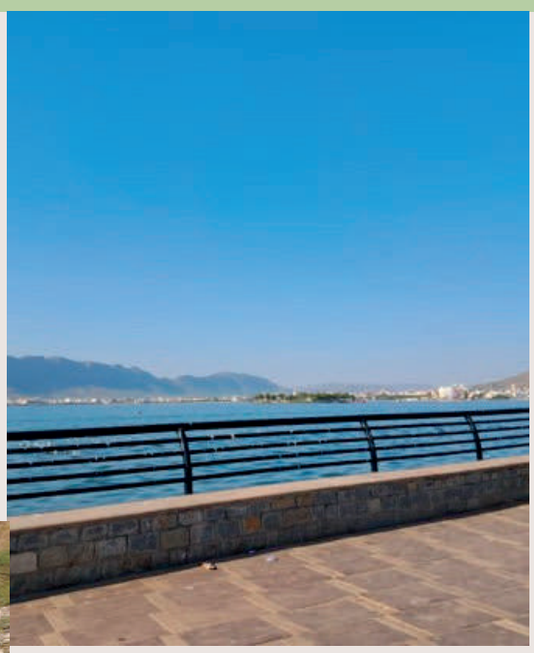
Rooftop Solar Panels-STP
Rooftop Solar Panels-AMC Building

SUSTAINABLE TRANSPORT

Footpath at Anasagar Lake

Walking tracks are provided for promotion of non-motorized transportation across the periphery of the Anasagar lake. The best way to mitigate against climate breakdown in cities is to increase and improve the infrastructure for walking and bicycling.





SUSTAINABLE TRANSPORT

Cycling track at Old Vishramsthali

Cycling tracks are provided for promotion of non-motorized transportation across the periphery of the Anasagar lake. There are dedicated cycles and stands provided by Green Peace Foundation. Walking and cycling are appealing substitutes for motorised transportation because they offer a safe, affordable mode of transportation.

WASTE MANAGEMENT
Composting of Garden Waste

The biodegradable garden waste is collected from all over the city and brought to the STP plant at Anasagar Lake and is further composted using the technique provided by Swasth. By reducing the amount of organic waste dumped in landfills, composting helps to mitigate the release of methane, a powerful greenhouse gas. The second benefit of composting is that it creates a nutrient-rich soil amendment that may be used to strengthen the soil, boost crop yields, and store carbon in the ground. This may result in a decrease in the need of artificial fertilisers, which require a lot of energy to produce and increase greenhouse gas emissions. Composting can also lessen the need for energy- and water-intensive landfill operations, which will result in additional energy savings and emissions reductions.

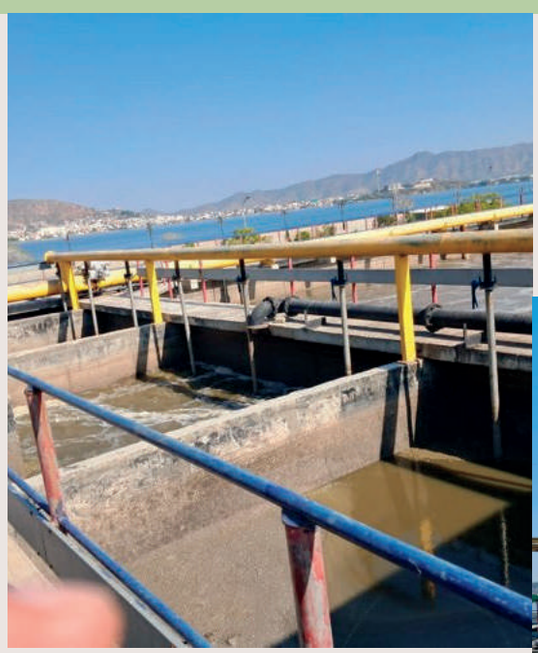
WASTE MANAGEMENT
Plastic Waste Management

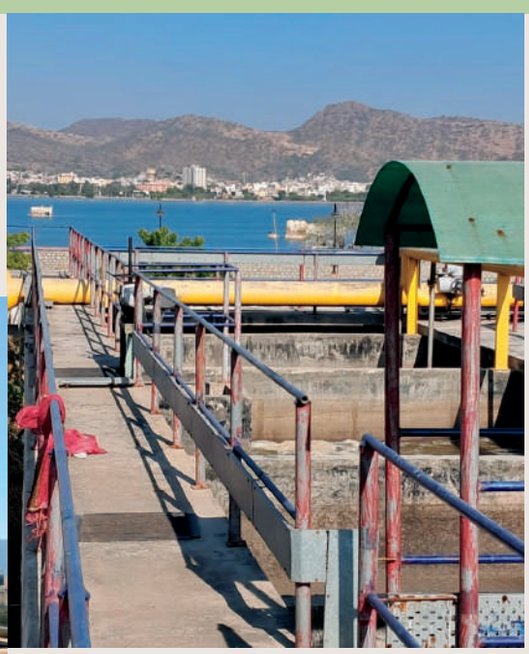
Using plastic as a refuse-derived fuel (RDF) in the cement industry for co-processing can help combat climate change. This is because using plastic waste as a fuel alternative in cement production can reduce the consumption of non-renewable fuels such as coal and petroleum coke, which are significant contributors to greenhouse gas emissions. In addition, co-processing plastic waste in cement kilns can divert the waste from landfills. Overall, using plastic as an RDF in the cement industry can contribute to a circular economy and help reduce greenhouse gas emissions, making it a viable option for combating climate change.

POLLUTION CONTROL

STP-Anasagar Lake

The STP at Anasagar lake helps in mitigating the impact of climate change by reducing greenhouse gas emissions, protecting water resources, and conserving water. The treated waste water is reused for gardening & for composting process in the vicinity of the plant.

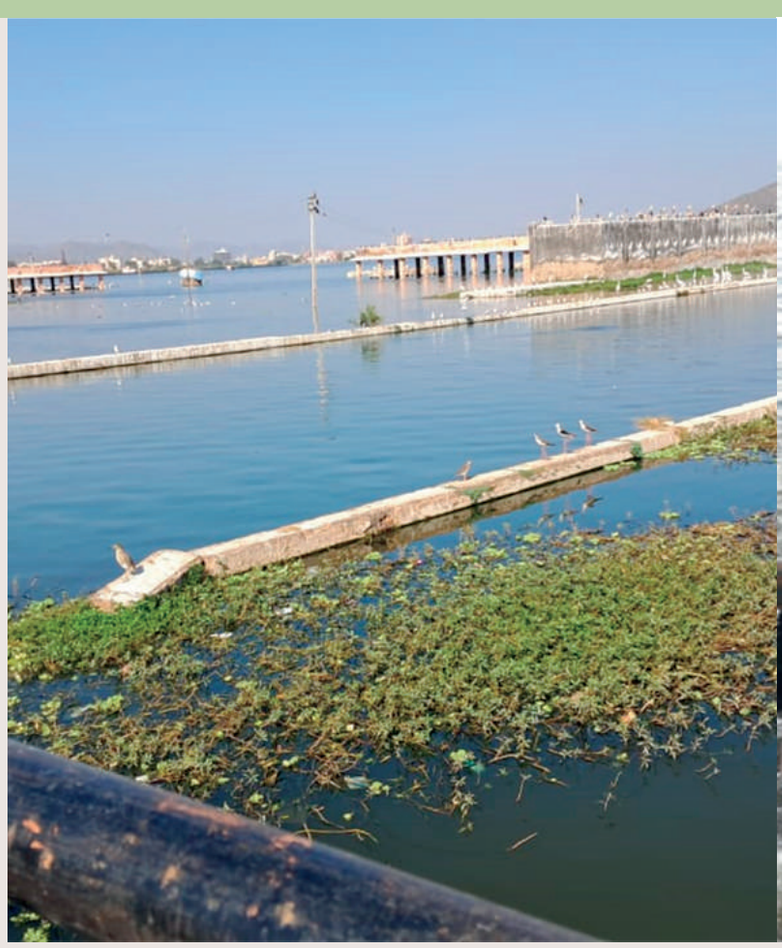




WATER BODY CLEANING

De-weeding at Anasagar Lake

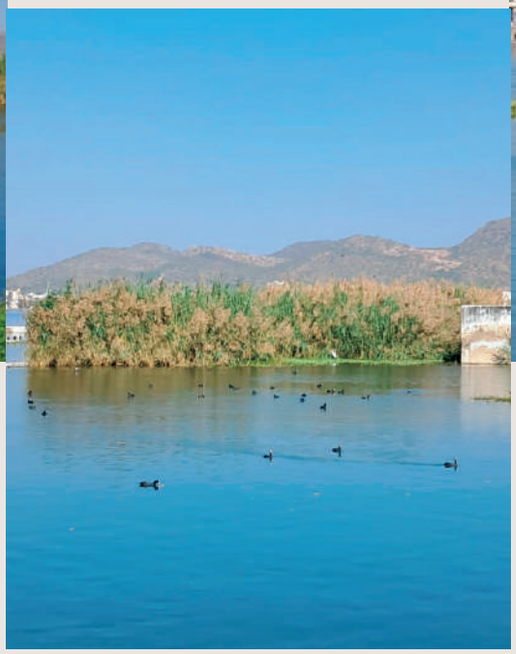
If lake weed removal is done properly, it can maintain the natural equilibrium of a body of water by reducing the nutrient levels in the lake water. When algae and other water plants grow excessively (covering more than 25% of the surface area), it can lead to various issues such as fish kills, unpleasant odor in the water, and stunted fish growth.

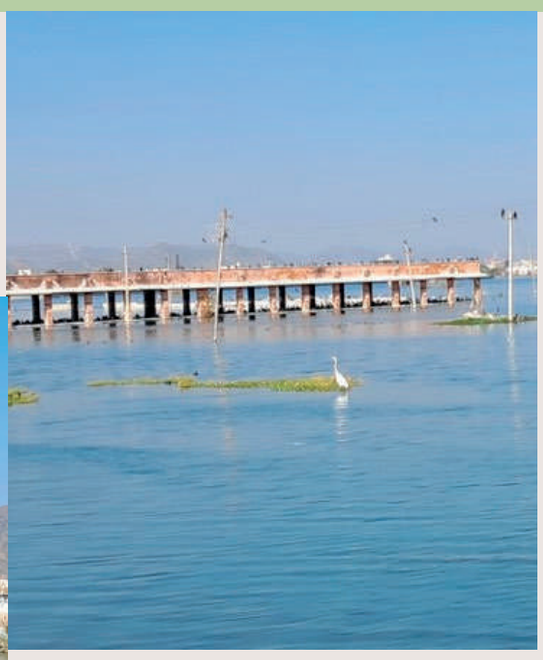


WATER CONSERVATION

Bird Park at Sagar Vihar Area (Wet Land)

The Anasagar wetlands are vital habitat for various plant and animal species, including migratory birds. Protecting this wetland through conservation efforts has helped to safeguard these species and maintain the overall health and resilience of the ecosystem, which is crucial in the fight against climate change. Wetlands are highly efficient in sequestering carbon from the atmosphere, making them one of the most effective ecosystems in terms of reducing greenhouse gas emissions and mitigating the effects of climate change. Overall, preserving wetlands can have a significant impact on climate change by not only sequestering carbon, but also reducing flood risks, preserving biodiversity, and improving water quality.





GREEN COVER

Subhash Garden

Subhash Garden is large park with fountains & a Shiva temple, it also has a promenade on the edge of Anasagar Lake. It also has other facilities like toy train, boat, walking track, jogging track & cycling track. The green space provides a recreational space as well as helps in reducing the Urban Heat Island effect & GHG emissions.

GREEN COVER

Seven Wonders Park, Gaurav Path

The Seven Wonders Park provides opened green space access to the public, the park is also a major tourist attraction in the city. It is located near the Anasagar lake. It helps in carbon dioxide sequestration & reducing the GHG emissions by promoting eco-tourism.

GREEN COVER

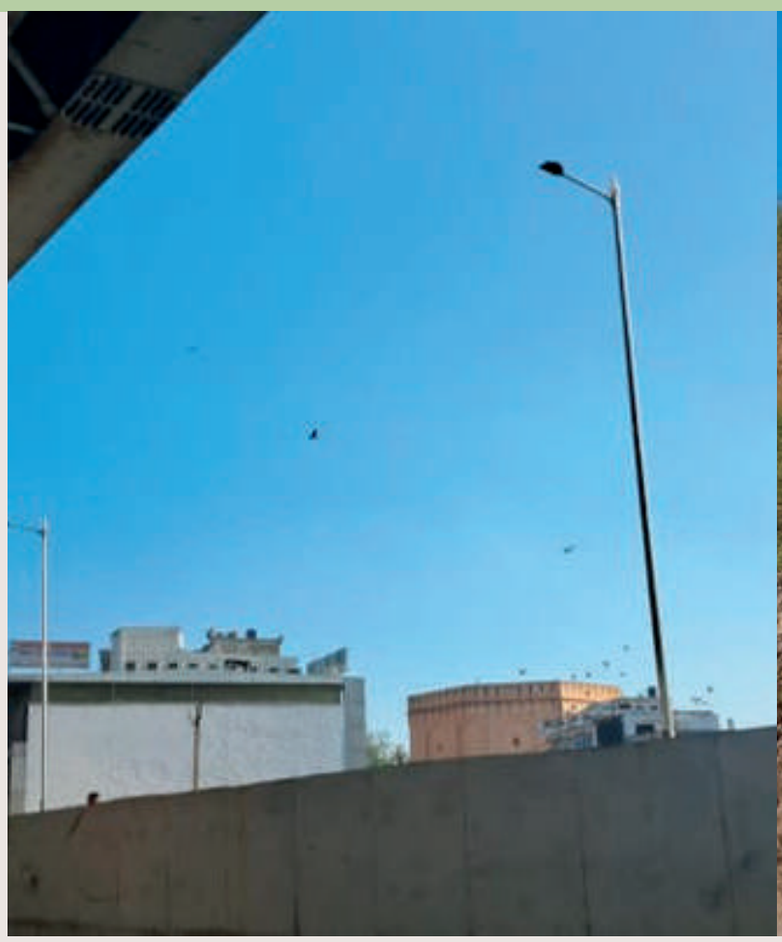
Lakefront Development

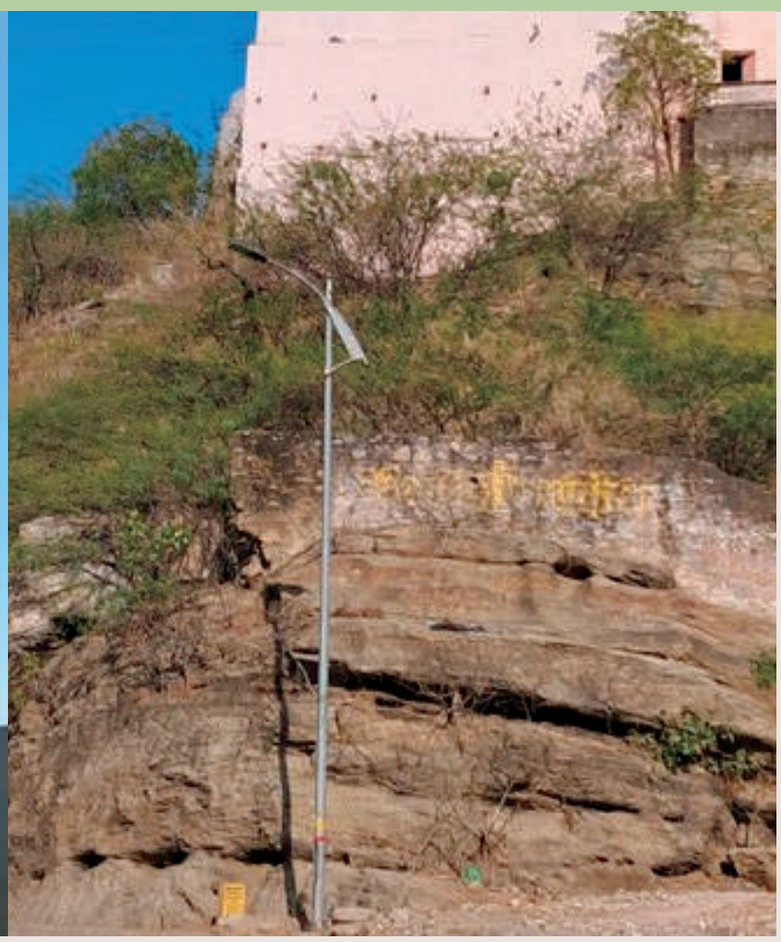
Lakefront development helps in combating climate change by protecting and restoring important ecosystems, improving climate resilience, and reducing greenhouse gas emissions. Lakefront development project improved the water quality in lake, it has also helped in restoration of wetlands and the implementation of green infrastructure, such as gardens.

ENERGY CONSERVATION

Street Lights-LED

All the street lights in the city are being installed with the LED light, which helps conserve energy and thereby reduces GHG emissions. LEDs are more energy-efficient as they emit little heat, requiring less power to produce the same amount of light as traditional bulbs and they also emit fewer emissions.





RENEWABLE ENERGY

Rooftop Solar Panel-AMC

Rooftop Solar Panels are installed at Ajmer Municipal Corporation office, rooftop solar panels are a sustainable and cost-effective way to generate electricity, reduce energy bills, and contribute to efforts to combat climate change.

RENEWABLE ENERGY

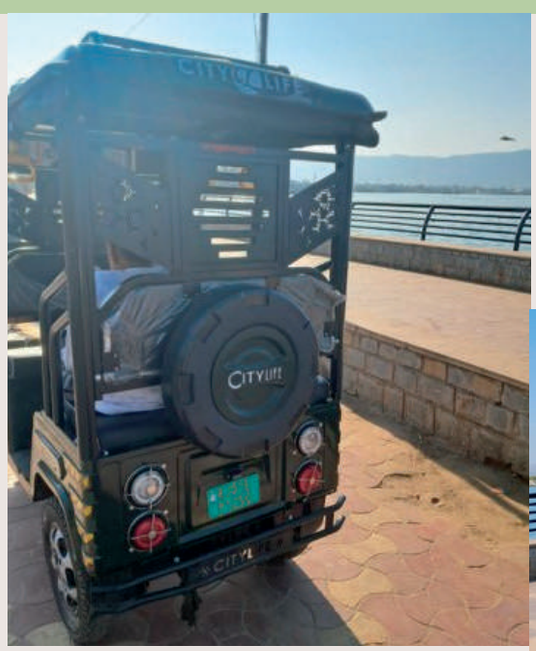
Solar Panel STP-Anasagar Lake

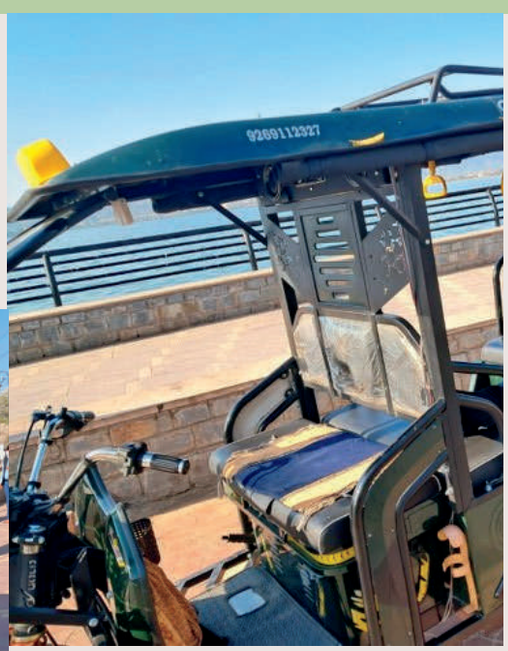
The STP at Anasagar lake is run on solar panels as well as the electricity from grid, the installation of solar panels have reduced the requirement of electricity by almost half. The treated waste water is reused for gardening.

RENEWABLE ENERGY

Electric Vehicles-Auto Rickshaw

EVs emit fewer greenhouse gases compared to gasoline or diesel-powered vehicles, which contribute significantly to climate change. As EVs run on electricity, their emissions are dependent on the source of the electricity used. However, even when taking into account the emissions from the electricity generation process, EVs produce significantly lower emissions compared to traditional vehicles. Additionally, as renewable energy sources become more widespread, the emissions associated with charging EVs will continue to decrease, making them an even more environmentally friendly option for transportation. Overall, the adoption of electric vehicles is an important step towards reducing greenhouse gas emissions and mitigating climate change.





MAHARASHTRA

Maharashtra is the third largest State in India accounting for 9.4% of the total geographical area of the country and the second most populous State. Maharashtra State is situated north of 14°N and south of 22°N. It is bounded by Arabian Sea on its western side and is located in the north center of peninsular India and has a long coastline stretching nearly 720 km along the Arabian Sea. The Western Ghats, which have an average elevation of 1200 metres and serve as a significant climatic divide for the area, are also one of the State's three major watersheds, giving rise to numerous significant rivers, including the Godavari and Krishna.

Rainfall in Maharashtra shows a significant variation across the state, with the coastal Konkan region receiving more than 2,000 millimeters of rainfall annually and the Vidarbha region recording the second highest rainfall. As one moves towards the easternmost districts, the average rainfall increases to about 1,400 millimeters. However, the rain shadow and Marathwada regions receive less than 600 millimeters of annual rainfall, which makes them drought-prone areas characterized by extreme aridity, hot climate, and acute water scarcity. Around a quarter of India's drought-prone districts are in Maharashtra, with 73% of its geographical area classified as semiarid. Maharashtra has faced severe and successive droughts, heavy rainfall, and cyclones in the past.

SOLAPUR

The coordinates of Solapur are 17.68°N 75.92°E, it is situated in the Deccan Plateau at an elevation of 458 metres (1502 feet). It is spread over an area of 14,895 square kilometers and is drained by the Bhima River. Solapur has a dry (arid and semiarid) climate with high humidity throughout the year, an oppressive summer, and heavy rainfall during the southwest monsoon season. The mean daily maximum temperature is 40°C and the mean daily minimum temperature is 13°C, with the highest temperature ever recorded being 48°C in April 1988. The district receives scanty rainfall, with an annual average of 625 mm. Solapur has an average annual temperature of 27.3 °C and an average annual precipitation of 835 mm. The summer season is intense with temperatures going up to 47°C, while winters have very little rainfall.

CLIMATE ACTION

WASTE MANAGEMENT

SWM Processing & Treatment
Composting
Biomining
BMW Treatment
RDF

POLLUTION CONTROL

Waste Water Treatment & Reuse of treated water

GREEN COVER

Public Gardens/ Parks
Plantation
Miyawaki Forest
Nursery Development

ENERGY CONSERVATION

Green Building

RENEWABLE ENERGY

Rooftop Solar Panels
Biogas

WASTE MANAGEMENT

SWM Processing & Treatment

The solid waste from city is collected & brought to transfer station, from where it is brought to the integrated waste management facility for further processing. The waste is segregated in to biodegradable and non biodegradable category. The biodegradable waste is used for generation of biogas and compost, while the inorganic, non biodegradable fraction is recycled or sent for co-processing, all these process help in reducing the GHG emissions. Sustainable waste management practices can also help conserve natural resources, reduce pollution, and promote circular economy principles.

WASTE MANAGEMENT

Composting

Solapur Bio-Energy Systems Private Limited manufacturers and supplies compost of two types that is approved by FCO- Organic city compost and Phosphate Rich Organic Manure (PROM).
The compost from MSW is obtained through the windrow composting method, while the sludge obtained from the biogas plant is used as a phosphate rich organic manure.

WASTE MANAGEMENT

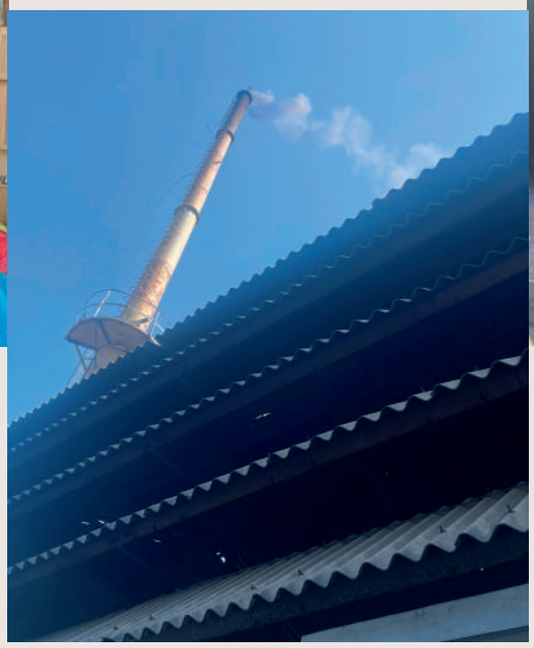
Biomining

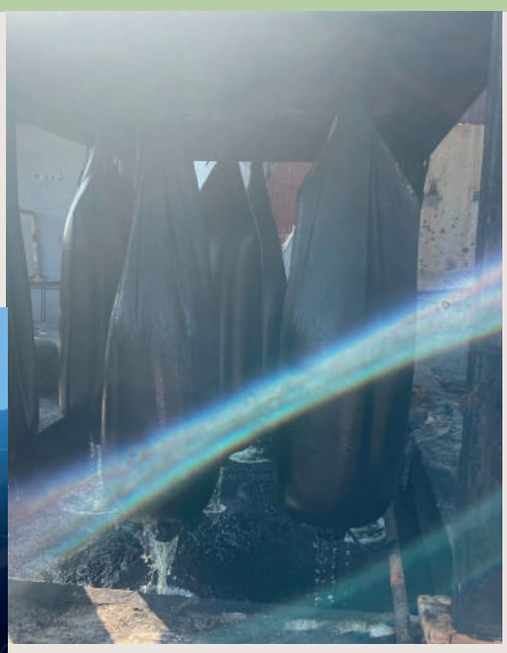
Legacy waste refers to waste that has been accumulated over a long period of time and is usually composed of a variety of materials that are difficult to separate and recycle. Biomining is a process that uses microorganisms to extract valuable materials from waste, such as metals and minerals. This process not only recovers valuable resources but also reduces the amount of waste that ends up in landfills or incinerators, which can produce greenhouse gases (GHG). The work on project has just initiated at Solapur.

WASTE MANAGEMENT

BMW treatment

Proper treatment of biomedical waste can aid in mitigating climate change by minimizing greenhouse gas (GHG) emissions resulting from the untreated waste disposal. The disposal of medical waste is the largest contributor to the carbon footprint of the healthcare industry, accounting for nearly 70% of its total carbon footprint. Improper off-site treatment of medical waste can also pose a significant public health hazard.





WASTE MANAGEMENT

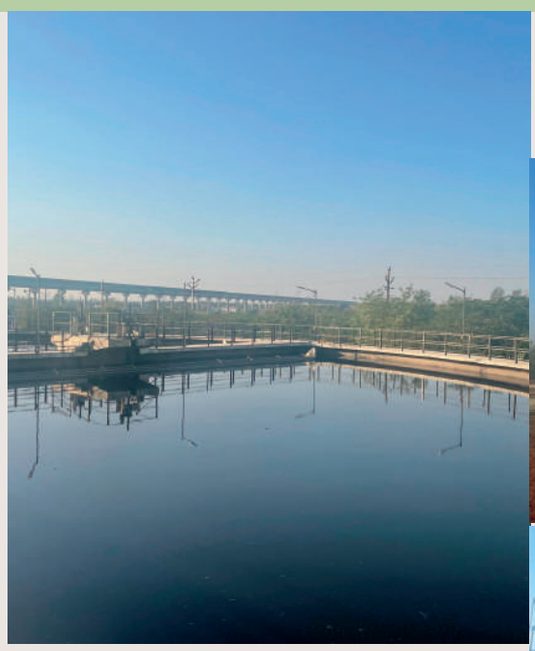
RDF

The waste that come to the integrated waste management facility of Solapur Bioenergy Systems Pvt. Ltd. is further segregated into wet and dry waste and the non-organic waste such as plastic, metal, etc., is used for other purposes such as recycling, co-processing. The RDF is sent to the nearby cement industry for co-processing. Co-processing plastic waste in cement kilns can divert the waste from landfills.

POLLUTION CONTROL

Waste Water Treatment

STPs help in reducing the amount of untreated sewage that is released into water bodies which can emit large amounts of methane, a potent greenhouse gas. By treating the sewage, the amount of methane released can be reduced. The STP is capturing the methane from untreated sewage entering the plant and then converts it to biogas to fuel the engine for the plant, thereby reducing the dependence on the electricity from grid.



GREEN COVER
Plantation

The Municipal Corporation office campus is also having well-maintained plantation in its garden. The green space is used by public, there are a lot of people coming in morning and evenings to the garden for walking, exercising, jogging. Thus providing an opportunity for adaptation to sustainable lifestyle and healthy practices.

GREEN COVER

Miyawaki Forest

Mandal Engineering Training Centre, Solapur has created a Miyawaki forest wherein the native species including fruit-bearing trees are planted. Miyawaki forest is a dense, multi-layered forest that is created by planting a variety of native species in a small area. This forest development technique can help in mitigating climate change by several ways viz. carbon sequestration, conserving biodiversity and ecosystem services, reducing soil erosion and increasing water infiltration and in mitigating the urban heat island effect

GREEN COVER
Gardens & Parks

There are many gardens and parks developed and maintained within the city. The plants and trees are of native species and the documentation has been done through tree census. Green cover helps in mitigating the impact of climate change by carbon sequestration, reducing GHG emissions, it also reduces the impact of heat island in the city.

GREEN COVER

Nursery Development

A nursery for native plant species is developed at the land earmarked for development of a picnic spot in the city. These plant would be further used for plantation in the area itself to develop the green cover at the picnic spot.

ENERGY CONSERVATION

Balaji Sarovar Hotel, Green Building

The Balaji Sarovar Hotel, at Solapur is a LEED India Gold rated building. It has water efficient landscaping, innovative wastewater technologies, follows practices as storage and collection of recyclables, construction waste management, in addition to a wide spectrum of other green practices.

RENEWABLE ENERGY

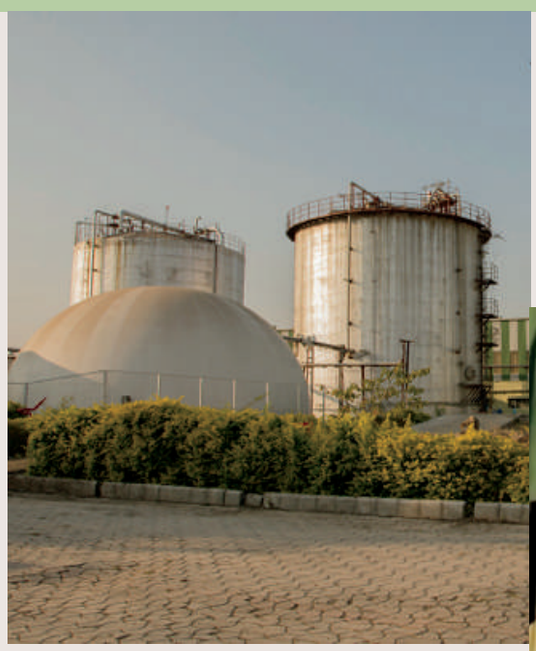
Solar Panels

Solar Panels are installed at the STP, it produce electricity without emitting harmful pollutants or greenhouse gases, which helps to reduce carbon emissions and air pollution. Thus, solar panels are a sustainable and cost-effective way to generate electricity, reduce energy bills, and contribute to efforts to combat climate change.

RENEWABLE ENERGY

Biogas

Solapur Bioenergy Systems Pvt. Ltd. is the first of its kind, large-scale municipal solid waste treatment and processing plant in Solapur, Maharashtra based on the patented DYRAD ™ technology. The Waste from the city (Mixed & Segregated) is segregated into inorganic and organic fraction. The organic fraction is then converted into biogas and high-quality fertilizers. The biogas produced is purified by scrubbing and is used as a source to generate electricity thus reducing the GHG emissions. Additionally, the process of producing biogas from waste can also help reduce the amount of waste that ends up in landfills, which are a significant source of methane emissions.



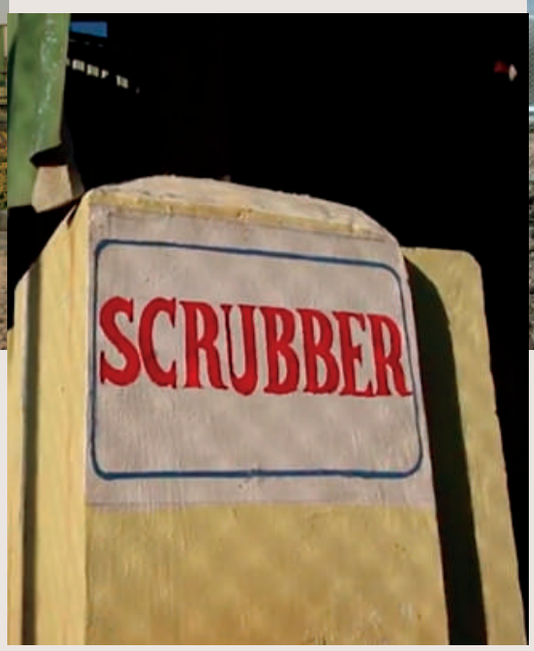


Photo Credit-Pratish Khedekar

SANGLI

Sangli district one of the southern district of Maharashtra is located between North latitudes 160 43' and 170.38' and last longitude 730.41' and 750.41' having an area of 8572 sq km. The district is mainly an agricultural district falling in Krishna river basin. The district's climate is generally pleasant but tends to be dry for most of the year. On average, the district receives 670.1 mm of rainfall per year. The hottest month, April, has an average daily maximum temperature of 38.1°C and an average daily minimum temperature of around 21.2°C.

Sangli experiences a semi-arid climate with three distinct seasons: a hot and dry summer from mid-February to mid-June, a monsoon from mid-June to late October, and a mild and cool season from early November to early February. The city receives a decent amount of rainfall, with an average of 22 inches (580 mm) per year.

CLIMATE ACTION

SUSTAINABLE TRANSPORTATION
Footpath, Cycling Track

WASTE MANAGEMENT
SWM processing & Treatment
Plastic Waste Collection & Co-processing
C & D Waste management
Composting

POLLUTION CONTROL
Waste Water treatment & reuse of treated water
Air Quality Monitoring

WATER BODY CLEANING
Rejuvenation of water body

WATER CONSERVATION
Water Recharging
Rain Water Harvesting

GREEN COVER
Gardens/ Parks, Terrace Garden
Green corridor, buffer zone plantation
Miyawaki Forest

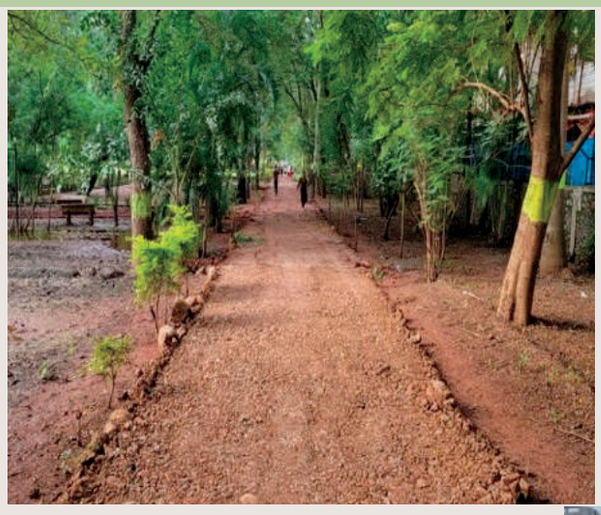
ENERGY CONSERVATION
Street Lights-LED, Solar
Green Building
E-Vehicles

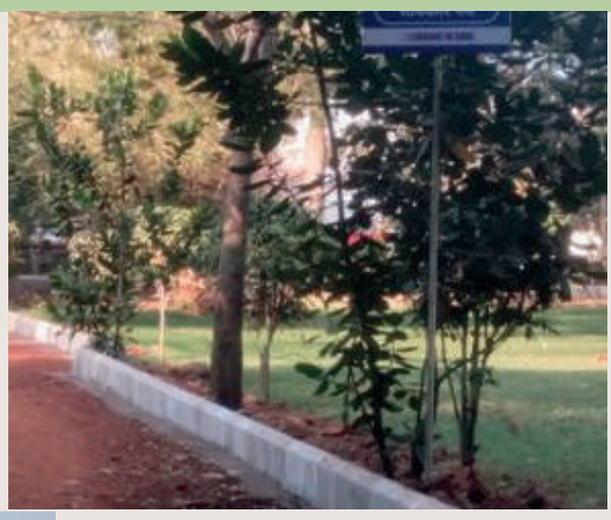
RENEWABLE ENERGY
Rooftop Solar Panels

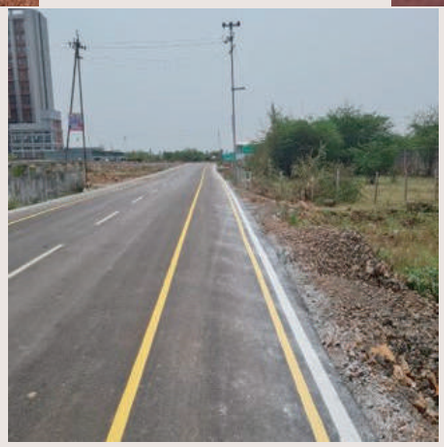
SUSTAINABLE TRANSPORTATION

Walking & Cycling track

To combat climate change, it is crucial to have improved and increased infrastructure for walking and cycling in cities. These modes of transportation offer an appealing alternative to motorized vehicles, as they are a dependable and low-cost options. By enhancing walking and cycling infrastructure, people can continue to travel in a healthy, safe, and environment-friendly way.



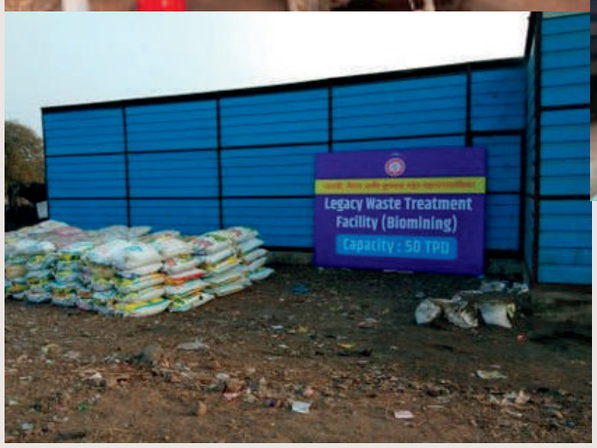




WASTE MANAGEMENT

SWM Processing & Treatment

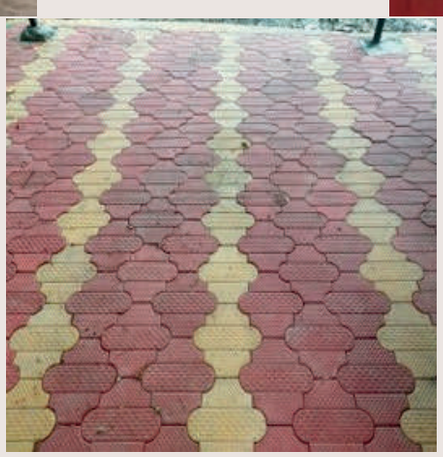
By implementing sustainable waste management practices like recycling, composting, and energy recovery, the amount of waste sent to landfills and incinerators can be reduced, leading to lower GHG emissions. This can also help conserve natural resources, reduce pollution, and promote circular economy principles.



WASTE MANAGEMENT

C&D Waste Management

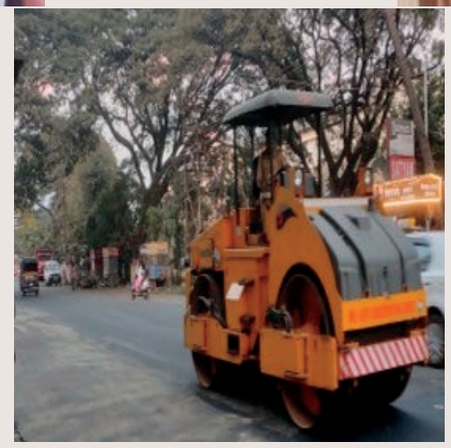
C&D waste, which includes building materials such as concrete, wood, and steel, can be recycled and reused, reducing the need for new materials and the associated greenhouse gas emissions from their production. Proper management of C&D waste can also reduce methane emissions from landfills where these materials may otherwise end up. Additionally, sustainable building practices such as green building design and energy-efficient building materials can further reduce the carbon footprint of construction activities.



WASTE MANAGEMENT

Plastic Waste Management

Plastic waste is used in the construction of roads by mixing shredded plastic waste with bitumen to create a polymer-modified bitumen. This technique has numerous advantages, such as reducing the amount of plastic waste in landfills and the environment, increasing the longevity of roads, reducing the use of bitumen, and lowering GHG emissions by reducing the energy required for road construction and maintenance.



POLLUTION CONTROL

Waste Water Treatment

STPs help in reducing the amount of untreated sewage that is released into water bodies which can emit large amounts of methane, a potent greenhouse gas. By treating the sewage, the amount of methane released can be reduced. The STP is capturing the methane from untreated sewage entering the plant and then converts it to biogas to fuel the engine for the plant, thereby reducing the dependence on the electricity from grid. The STP displayed in the photographs is also having an innovative FSTP. Besides, the treated wastewater from the plant is reused for multiple purposes viz. jetting machine, fire extinguishing etc.

POLLUTION CONTROL

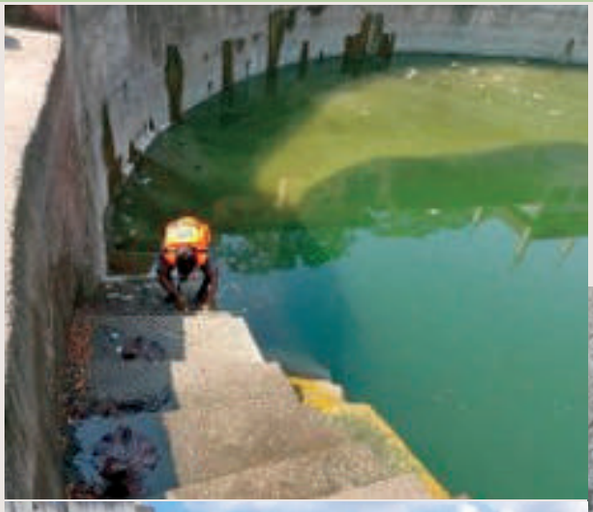
Air Quality Monitoring

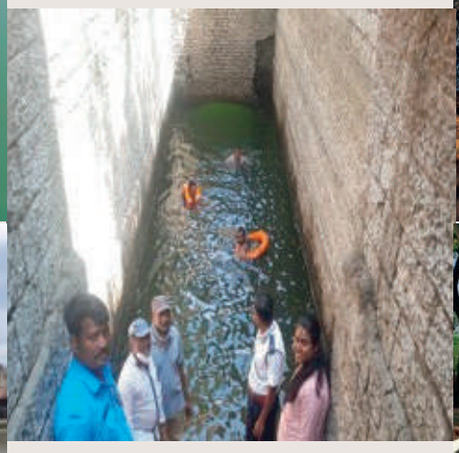
Air quality monitoring is done at multiple locations in the city. Air quality monitoring is important for mitigating climate change as it provides essential information about the amount and dispersion of harmful substances in the air. By keeping track of greenhouse gas levels, particulate matter, and other pollutants, decision-makers can determine regions where emissions need to be lowered and take action to enhance air quality.

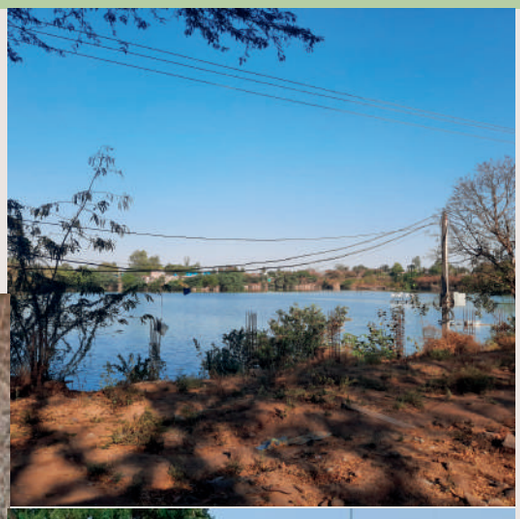
WATER BODY CLEANING

Rejuvenation of Water Body

Cleaning and restoring water bodies like lakes, rivers, wells, and ponds can mitigate climate change by storing carbon, improving ecosystem health and biodiversity, reducing urban heat island effect, and improving water quality and availability.







WATER CONSERVATION

Water Recharging

There are recharge pits at several location in the city. Groundwater recharge through percolation pits involves creating small pits in the ground to allow rainwater to percolate down to the aquifers and recharge the groundwater. This technique can help in mitigating the impacts of climate change by increasing the availability of groundwater resources and reducing the risk of droughts and water scarcity. It also helps in reducing soil erosion and improving soil quality. By increasing the groundwater levels, it can also help in restoring and conserving ecosystems and promoting biodiversity.

WATER CONSERVATION

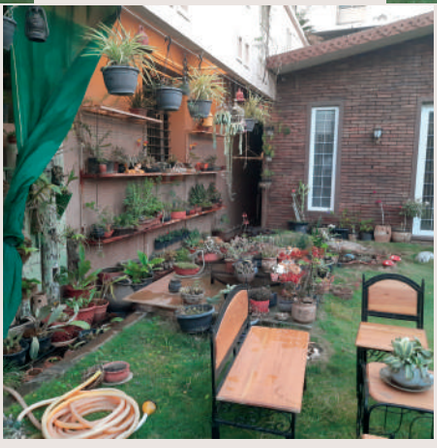
Rain Water Harvesting

Rainwater harvesting can help in mitigating climate change by reducing the demand for freshwater, reducing runoff and soil erosion, and increasing the availability of water for agricultural and non-agricultural purposes. It also helps in reducing flooding and groundwater depletion, improving water quality, and promoting sustainable development. Overall, rainwater harvesting is an effective strategy for climate change adaptation and mitigation.

GREEN COVER

Terrace Garden-Hospital

There are many houses in Sangli that have developed terrace gardens, the pictures in the display are from Mahatma Gandhi Cancer Hospital. Terrace gardens can provide additional green space in urban areas, which helps combat climate change by absorbing carbon dioxide, reducing the urban heat island effect, and promoting biodiversity. They can also contribute to food security and sustainable agriculture practices.



GREEN COVER

Green Corridor & Buffer Zone

The dumping ground approach road as well as the open Nallahs buffer zones areas are used for plantation, this gives a good green cover to the other wise unsightly view, also reduces the emanating foul smell. By planting trees and other vegetation around open Nallahs buffer zones and dumping grounds, we can reduce the amount of carbon dioxide and other GHGs in the atmosphere, thereby mitigating the impact of climate change. Additionally, vegetation can help in controlling erosion, improving soil quality, and providing habitat for biodiversity, which can also contribute to mitigating the impact of climate change.

GREEN COVER

Miyawaki Forest-Atal Anandvan

Atal Anandvan is a Miyawaki forest, with plantation of native species in the city. Miyawaki forest development is a technique that can help mitigate climate change in several ways. The technique involves planting a variety of native species in a small area to create a dense, multi-layered forest. This can help sequester carbon, conserve water, support biodiversity, and mitigate the urban heat island effect. Overall, Miyawaki forest development can be an effective tool for promoting sustainable development and reducing greenhouse gas emissions.

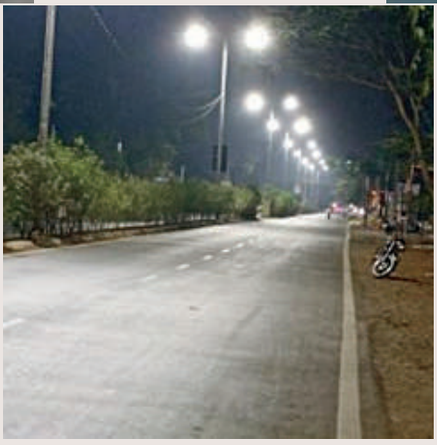
GREEN COVER
Gardens & Parks

There are several gardens and parks in the city, providing green space in urban areas, which helps combat climate change by absorbing carbon dioxide, reducing the urban heat island effect, and promoting biodiversity.

ENERGY CONSERVATION

Street Light-Solar & LED

LEDs are considered energy-efficient since they produce minimal heat, which means they consume less energy to produce the same amount of light compared to their traditional counterparts. In contrast, incandescent bulbs lose 90% of their energy as heat, while fluorescent lights lose about 80% of their energy as heat. By using LED lights, energy conservation can be achieved since they are 40 to 60% more energy efficient than conventional lighting technologies. Also, the emissions generated by LED street lights are very less as compared to the other conventional equivalents.



ENERGY CONSERVATION

Green Building

Kullolli Hospital, Sangli is a Griha certified Green Building. It has got various interventions in place,to name a few-Rain Water Harvesting, Reuse & Recycling of waste material for upcycling, Solar Panel installation, Waste Water Treatment plant, the treated water is reused for gardening, Solid waste management-Segregation & collection of waste at source, composting of food waste through OWC, biomedical waste segregation & collection etc.

ENERGY CONSERVATION
Electric Vehicles

Electric vehicles have the potential to reduce greenhouse gas emissions and improve air quality, as they produce zero tailpipe emissions. They are also more energy-efficient than gasoline or diesel-powered vehicles, and can be powered by renewable energy sources such as wind or solar power. The city promotes use of E-Vehicles.

RENEWABLE ENERGY

Rooftop Solar

Renewable energy sources like solar can play a significant role in mitigating climate change. They offer several benefits, including reduced greenhouse gas emissions, improved air quality, increased energy independence, and job creation in the renewable energy sector. Solar energy, in particular, is a versatile and abundant source of renewable energy that can be harnessed to power homes, businesses, and even entire communities. The city has several schools, office buildings and houses with Rooftop Solar Panels.

NANDED

Nanded District is located in the eastern part of Marathwada Region, Maharashtra, India, between 18°16’ to 19°55’ North latitude and 76°56’ and 78°19’ east longitude. The district has a geographical area of 10502 sq km and a population of 33.57 lakhs according to the 2001 census. The climate of the district is mostly dry except during the monsoon season, with an average annual rainfall of 991.5 mm. May is the hottest month with the mean daily maximum temperature of around 42°C and mean daily minimum temperature of about 26°C.

CLIMATE ACTION

SUSTAINABLE TRANSPORTATION

Footpath & Cycling Track

WASTE MANAGEMENT

SWM processing & Treatment
Composting

POLLUTION CONTROL

Waste Water Treatment
Reuse of Treated Water
Air Quality Monitoring

WATER CONSERVATION

Rain Water Harvesting

GREEN COVER

Public Gardens/ Parks
Miyawaki Forest
Plantation
Nursery Capacity Expansion

ENERGY CONSERVATION

Street Lights-LED & Solar

RENEWABLE ENERGY

Rooftop Solar Panels

SUSTAINABLE TRANSPORTATION

Footpath & Cycling Track

Many of the roads in the city are provided with Walking & Cycling Tracks. It is essential to improve and expand walking and cycling infrastructure in urban areas to fight against climate change. These forms of transportation present an attractive alternative to motorized vehicles, as they are reliable and inexpensive. By improving infrastructure for walking and cycling, individuals can continue to travel in a healthy, safe, and eco-friendly manner.

WASTE MANAGEMENT

SWM Processing & Treatment

The SWM is collected and transported for further processing nd treatment to the centralized waste management facility at Tuppa, Nanded. The wet & dry waste is further segregated, the wet waste is composted and the dry waste is recycled and thus minimize the amount of waste sent to landfills. This approach also helps conserve natural resources, limit pollution, and encourages the principles of a circular economy.

WASTE MANAGEMENT

Composting

The Mata Gujari Ji Visava Garden premises has a vermi composting facilities where the garden waste is used to create compost and the compost is utilized in the gardening activities within the park. Vermicomposting helps reduce the amount of organic waste sent to landfills, where it would emit methane, a potent greenhouse gas. Additionally, vermicomposting can help to sequester carbon in the soil, improving soil health and reducing the amount of carbon dioxide in the atmosphere. By diverting organic waste from landfills and promoting healthy soil, vermicomposting can play a role in mitigating climate change.

POLLUTION CONTROL

Air Quality Monitoring

Air quality monitoring is crucial for mitigating climate change as it provides vital data on the presence and distribution of pollutants in the air. By tracking greenhouse gas levels, particulate matter, and other pollutants, policymakers can identify areas where emissions need to be reduced and take steps to improve air quality. Air quality monitoring is carried out at several locations throughout the city.

POLLUTION CONTROL

Waste Water Treatment-STP

Mata Gujari Ji Visava Garden is a modest amusement park having a decentralized Sewage Treatment Plant. The decentralized wastewater treatment plants offers an efficient and sustainable solution for managing wastewater. It helps reduce GHG emissions by treating wastewater on-site and reusing the treated water for non-potable purposes. It also help prevents water pollution by treating wastewater closer to the source.

POLLUTION CONTROL

Treated Waste Water Reuse

The treated Waste Water from the decentralized STP located in Mata Gujari Ji Visava Garden is used to water the plants in the garden itself. This substantially reduces the requirement for fresh water, helps in conservation of water.

WATER CONSERVATION

Rain Water Harvesting

Many of the houses in Nanded have RWH facility, the picture is from a house from Shastri Nagar locality in Nanded. The rainwater harvesting techniques not only replenishes the water table, but also helps in conservation of water bills, and improves the groundwater quality.

GREEN COVER
Gardens & Parks

The Municipal Corporation of Nanded also maintains existing green covers in parks and other areas as the green covers serve the purpose of a rainwater buffer, ultimately helping in groundwater conservation. Green spaces also help to regulate the temperature and micro climate of the areas.

GREEN COVER

Miyawaki Forest-Raghunath Nagar

City of Nanded has undertaken the Miyawaki Forest method for afforestation, an efficient technique for creating mini-forests quickly. In comparison to conventional afforestation methods, Miyawaki forests work well in urban settings and have more biodiversity. These forests serve the purpose of carbon sequestration, increasing green cover, lowering air pollution and maintaining the water table of the area. The picture is of the forest developed at Raghunath Nagar, Nanded.

GREEN COVER
Plantation

Nanded has planted trees of native varieties on both the forest and non-forest land. The tree plantation is done using all indigenous plant varieties that grow peculiarly in the local climate. Planting of native trees has not only improved the chances of survival of the green cover, but also made the maintenance a deal of low cost and effort. Planting native species of trees and shrubs also helps to re-establish the original ecosystem of the region.

GREEN COVER

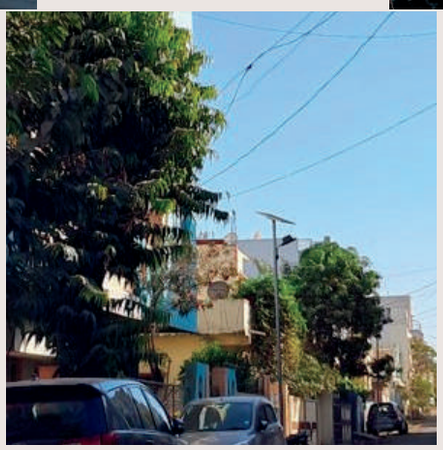
Nursery Expansion

Nanded Municipal Corporation has taken initiatives to enhance the capacities of local nurseries in the city to help them raise a good selection of healthy trees, shrubs and plants. The plants from these nurseries are used in plantation drives and building green spaces. The city has also prepared a a biodiversity register.

ENERGY CONSERVATION

Street Light-LED, Solar

The Street Lights have been fitted with LED and also having Solar Panels installed at some places. LEDs are energy-efficient as they emit little heat, requiring less power to produce the same amount of light as traditional bulbs. LED lights are 40-60% more energy efficient than traditional lighting and emit fewer emissions. Solar Panels helps in reducing the dependence on fossil fuel based energy and reduces the GHG emissions.



RENEWABLE ENERGY

Rooftop Solar Panels

Some buildings in Nanded are equipped with solar rooftop panels. Use of solar energy not only promotes use of renewable energy sources, it helps to cut down dependency on conventional electricity which in turn, cuts down emission and power consumption costs.

CLIMATE ACTION IN INDIAN CITIES

Special Coverage on Climate Action in 5 cities from Rajasthan & Maharashtra

Best Practices-Case Studies, India

Energy Conservation, Sustainable Solid Waste Management, Water Conservation

BEST PRACTICES-CASE STUDIES, INDIA

A compilation of Best Practices on Climate Action in some of the categories-Energy Conservation, Sustainable Solid Waste Management, Water Conservation is provided as reference and guide to the cities in India. The origins of the information are appropriately recognized and accurately referenced in appropriate sections.

THEME

- Energy Conservation
- Sustainable SWM
- Water Conservation

STATES/ UTs HIGHLIGHTED

- Leh (Ladakh)
- Jalgaon (Maharashtra)
- Himachal Pradesh
- Indore (Madhya Pradesh)
- Almora (Uttarakhand)
- Delhi

ENERGY CONSERVATION

This section showcases two case studies- One is running a waste management plant that is powered by Solar energy and the other one is production of biomethane as a renewable source of energy that is used for management of ago waste.

CASE STUDIES

Solar energy-based waste management at Leh

Sustainable Agro-waste management by energy generation using Biomethanation at Jalgaon

SOLAR ENERGY BASED WASTE MANAGEMENT PLANT AT LEH

The waste management plant at Leh is run on solar energy making it a unique and exemplary model specifically for the highland areas that is sustainably operated following a 3 R approach.

- Place-Leh
- Year-2017
- Project-Tsang-da-Urban Mission
- Problem statement- operating a waste management facility in the highland area with uneven topography and insufficient funds.
- Aim- Sustainable management of waste, practicing 3 R approach and making the entire operation cost effective, reducing the dependence on fossil fuel based energy.
- Unique feature- The waste management plant is run on the Solar energy.

SOLAR ENERGY BASED WASTE MANAGEMENT PLANT AT LEH

The committee set up with the efforts of UT that includes members of municipal corporation, government of UT, and members from LAHDC looks after the planning, implementation and monitoring of the waste management activities and IEC and Recycling camps.

To facilitate waste segregation at source, the municipal committee provided two dustbins - a blue one for non-biodegradable waste and a green one for kitchen and other biodegradable waste - to each household. The municipal committee also removed community bins to make Leh a garbage-free town and charted proper collection routes of vehicles for 100% door-to-door collection from all households, shops, hotels, and restaurants.

The Leh Municipal Committee installed a 30-tonne solid waste management plant in 2020 that is powered by a 100-kW solar power supply. The plant is spread over 38 acres of land and includes a manual segregation and waste processing unit, composting unit, and a scientific landfill facility for the disposal of inerts and rejects. Currently, the city is efficiently collecting segregated waste from households and commercial establishments using nine vehicles, which collect waste twice a day in commercial areas and once a day in small residential areas. Workers at the manual segregation unit segregate the waste and compress them into blocks that are sent to recyclers. The composting unit consists of a treadmill and a composting chamber that produces compost used in gardens, parks, and monasteries.

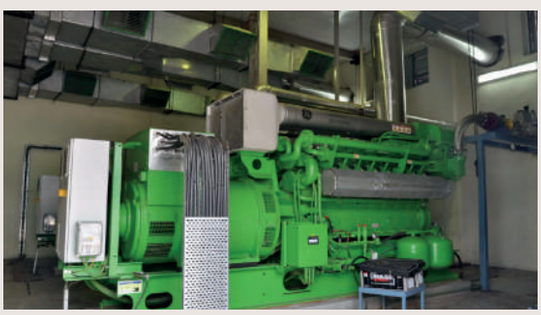
References:

Atin Biswas, Subhasish Parida et al. 2021, Waste-Wise Cities: Best practices in municipal solid waste management, Centre for Science and Environment and NITI Aayog, New Delhi.

SUSTAINABLE AGRO-WASTE MANAGEMENT BY ENERGY GENERATION USING BIOMETHANATION AT JALGAON

The agro-waste generated in the plant is used for production of bioenergy & the waste heat is used for refrigeration in other units making it a unique and innovative project.

- Place-Jalgaon, Maharashtra
- Year-2010
- Project-Jain Irrigation Systems Limited (JISL)
- Problem statement- Cost effective management of large quantities of agro-waste generation through its vegetable processing plant.
- Aim- To implement a sustainable approach to managing large quantities of agro-waste through biogas powered engine for the plant.
- Unique feature-The biogas produced through treatment of onion waste is used to power engine for producing electricity and the generated waste heat is used for a vapor absorption machine that provides refrigeration for PV manufacturing unit and onion cold storage chambers.



SUSTAINABLE AGRO-WASTE MANAGEMENT BY ENERGY GENERATION USING BIOMETHANATION AT JALGAON

Jain Irrigation Systems Limited (JISL) commissioned a biogas power plant on July 9th, 2010, with a design capacity of 1.668 MW. With the ability to produce 1.67 MW of electricity, 1,200 kg/hr of steam, and provide 400 TR of cooling, the efficiency of the entire plant is greater than 83%. The power plant has received recognition from the Ministry of New and Renewable Energy for being a unique project in India that deals with a variety of agricultural waste. It has also obtained approval for Renewable Energy Certification and received funding from MEDA. The establishment of the Biogas power plant has created employment opportunities for more than 50 local workers in the power generation and fertilizer division.

References:

https://www.mahaurja.com/meda/data/off_grid_bio_energy/Success%20Biomethanation.pdf

SUSTAINABLE SOLID WASTE MANAGEMENT

This section showcases two case studies- One is on the sustainable use of plastic waste in road construction and the other one is on transforming legacy wasteland to usable land by bioremediation.

CASE STUDIES

Sustainable Plastic Waste Management Plan at Himachal Pradesh

Conversion of Legacy Wasteland to usable land using Bioremediation at Indore

SUSTAINABLE PLASTIC WASTE MANAGEMENT PLAN AT HIMACHAL PRADESH

A sustainable plastic waste management plan is an exceptional and remarkable example of the management of plastic waste by following the 3 R approach.

- Place- Himachal Pradesh
- Year-2009
- Project- Sustainable Plastic Waste Management Plan
- Problem statement- Plastic littering was causing adverse impact on the fragile ecosystem of the Himalayas.
- Aim- The goal of this initiative is to create sustainable and eco-friendly methods for disposing of plastic waste.
- Unique feature- Environment-friendly and cost-effective solution to plastic waste.

SUSTAINABLE PLASTIC WASTE MANAGEMENT PLAN AT HIMACHAL PRADESH

The initiative aimed to find eco-friendly solutions for plastic waste disposal in the state. The first stage involved using plastic waste in road construction after processing household waste in cement kilns. A pilot run was conducted in Shimla, and after its success, a plan was created to make the project affordable and scalable. The government imposed a ban on plastic/polythene carry bags and organized awareness programs, and Polythene Hatao – Paryavaran Bachao campaign was launched to educate the public on the problems of plastic waste. In the second stage, 142 tons of polythene were collected from 10 districts for road construction, and the third stage focused on developing a sustainable mechanism for the collection and disposal of plastic waste. Water purifiers were installed at tourist points to discourage the purchase of plastic water bottles. The plastic waste was recycled and used in 36 road construction projects, totaling 200 km. The state government also took measures to enhance the initiative's efficiency by imposing a ban on plastic cups/glasses and restricting the entry of plastic waste from other states.

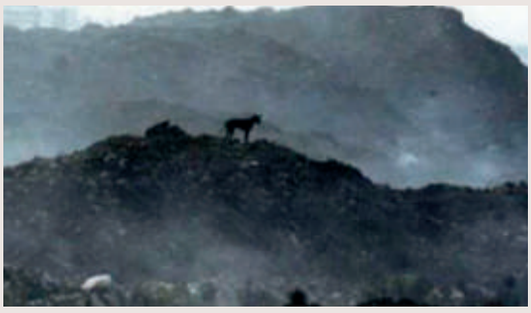
References:

Himachal using plastic waste to build roads, 2021. Sarkaritel.com News and Information Portal. https://www.sarkaritel.com/himachal-using-plastic-waste-to-build-roads/
https://timesofindia.indiatimes.com/city/shimla/himachal-first-in-country-to-use-plastic-waste-in-roads-project-standstill/articleshow/71195996.cms
https://www.hindustantimes.com/india-news/hp-to-buy-back-single-use-plastic-at-rs-75-per-kg-from-today/story-Bus5ed3VQeCKkPpSmP4KOP.html

CONVERSION OF LEGACY WASTELAND TO USABLE LAND USING BIOREMEDIATION AT INDORE

The conversion of legacy wasteland to usable land is a noteworthy and impressive example to control solid waste pollution and GHG emission in a sustainable and biodegradable way.

- Place- Indore, Madhya Pradesh
- Year-2018
- Project- Bioremediation of legacy wasteland
- Problem statement- Indore had an issue with increasing amounts of combustible materials in their waste causing pollution
- Aim- The goal is to bioremediate legacy and operational waste dumps within six months, reclaim 100 acres of land, reduce pollution and greenhouse gas emissions, increase real estate value, and benefit the citizens of Indore by eliminating dump fires, leachate generation, and foul odors.
- Unique feature- Use of environment-friendly and biodegradable approach to convert wasteland in usable land within 6 months.



CONVERSION OF LEGACY WASTELAND TO USABLE LAND USING BIOREMEDIATION AT INDORE

The Indore Municipal Corporation (IMC) bioremediated 100% of the legacy waste in Deoguradia, a dumpsite, reclaiming 100 acres of land worth Rs. 400 Cr. The site was divided into blocks based on contouring, and a long spike harrow was used to pull out rags, plastic, rubber, and textiles, while screens were used to filter coarse materials. Recyclables like plastic, metal, textiles, and glass were sold, and stones and ceramics were sent for land filling of low-lying areas. The soil was used to refill the ground to develop greenery while construction and demolition waste was sent for processing to produce building materials. The execution involved the deployment of 10 trommels, 15 horizontal screens, over 50 excavators, backhoe loaders, and 200+ workers, with Indore Smart City monitoring the progress. Furthermore, the reduction of Green House Gas Emissions, soil pollution, and groundwater contamination has resulted in an increase in the nearby real estate value. The initiative has motivated over 20 urban local bodies (ULBs) to initiate their own bio-remediation projects.

References:

Patel, T. (2019). Indore IAS Officer Clears 13 Lakh Tons of Garbage from 100 Acres in 6 Months! The Better India.

WATER CONSERVATION

This Section represents two case studies- One focuses on watershed management for efficient agriculture, including solar energy-based water pumps and the other one is about the restoration of Mansagar lake in Rajasthan.

CASE STUDIES

Watershed Management at Almora

Lake Rejuvenation at Delhi

WATERSHED MANAGEMENT AT ALMORA

The watershed management practices at Uttarakhand have overcome the water availability challenges for irrigation by implementing sustainable water conservation practices with efficient use of renewable energy.

- Place- Almora, Dehradun, and Pauri Garhwal, Uttarakhand
- Year-2014
- Project- Watershed Management
- Problem statement- Lack of water availability for irrigation which makes farming unproductive and forces villagers to migrate to towns for a more sustainable income.
- Aim- To construct water conservation facilities for irrigation along with efficient use of renewable energy to convert barren land into a fruitful land, resulting in increased income and improved standard of living for the people.
- Unique feature-The watershed management is run on the Solar energy.

WATERSHED MANAGEMENT AT ALMORA

The interventions of the project included the villagers constructing an irrigation tank with a maximum capacity of 15,000 liters, while experts from Vivekananda Parvatiya Krishi Anusandhan Sansthan provided training on how to dig the LDPE tanks. The project also established 10 solar panels with a capacity of 3,000 watts and connected 21 LDPE tanks through HDPE pipes to the overhead irrigation tank. An underground sedimentation tank was also built along the river, and a 3.2 HP submersible pump was installed to be powered by the solar panels. These interventions allowed for almost 435,000 liters of water to be stored, enough to irrigate crops. In Dharkot, Dehradun, six solar panels with a capacity of 300 watts each, along with a pump and controller, were installed to fill a 20,000-liter-capacity irrigation tank. Finally, in Kagthun Gram Panchyat, Pauri Garhwal district, the project dug up 9 hectares of plantation, 1200 contour trenches, and 500 recharge pits to improve the water regime in the catchment area of the natural water source.

The project's outcomes included the capacity for irrigating 50.80 hectares gross rainfed area, allowing farmers in the project villages to shift to the cultivation of cash crops and vegetables, which increased their incomes substantially and improved their standard of living. There was a considerable increase in the water level at the source situated at the lower end of the village, and reverse migration has been reduced. Solar energy emerged as a much more convenient and cheaper alternative to diesel, making it a climate-resilient and low-carbon footprint solution.

References:

NITI Aayog (2021) "COMPENDIUM OF BEST PRACTICES IN WATER MANAGEMENT - 2.0, 2021"

LAKE REJUVENATION AT DELHI

Rajokri lake rejuvenation in Delhi is a paramount example of transforming a wasteland into a model lake with water conservation and sewage management.

- Place- Rajokri Lake, Delhi
- Year-2018
- Project- Lake Rejuvenation
- Problem statement- Wastewater from Rajokri village was directly discharged into the lake, leading to its deterioration, mosquitoes' breeding, and sewage's sinking.
- Aim- To convert the turbid pond fed by sewage into clean waterbody for recharging the groundwater and providing a recreational spot for the villagers.
- Unique feature- The lake rejuvenation led to the conversion of wasteland into recreational spot.

LAKE REJUVENATION AT DELHI

The interventions included the construction of artificial wetlands, floating wetlands, grassland, rain gardens, parks, chhath ghat, amphitheater, and gravel walkways, as well as a Sewage Treatment Plant with a capacity of 600 kiloliters per day. Scientific wetland systems with active biodigesters technology were used to intercept drains from which sewage is fed into an underground sedimentation tank equipped with a biodigester. This coupled with filtration through aggregated stones reduced the BOD levels to half. Solar pumps push the water to an artificial wetland, where it passes through 2.5 deep gravel lined with water-treating plants such as Umbrella and Canna Indica which absorb toxins. The effluent then passes through three terrace gardens. It then gently passes from the slope of the grassland to the pond. A solar power-enabled pump installed in the middle of the pond recirculates the water. Carbon/sand filters and floating rafters were also installed.
The project resulted in the redevelopment of as much as 9500 sq. meters of area, with a 2000 sq. meter waterbody. Sewage is now treated before being discharged into the pond. The chhath ghat serves as a public space, and migratory birds have been spotted in the area surrounding the pond. Treated wastewater is used to recharge the pond.

References:

NITI Aayog (2021) "COMPENDIUM OF BEST PRACTICES IN WATER MANAGEMENT - 2.0, 2021"

ANNEXURES

LIST OF SDGs

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10. Reduce inequality within and among countries
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12. Ensure sustainable consumption and production patterns
Goal 13. Take urgent action to combat climate change and its impacts
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

LIST OF NDCs

1. To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for 'LIFE'– 'Lifestyle for Environment' as a key to combating climate change.
2. To adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development.
3. To reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level.
4. To achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF).
5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO_2 equivalent through additional forest and tree cover by 2030.
6. To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
7. To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
8. To build capacities, create domestic framework and international architecture for quick diffusion of cutting edge climate technology in India and for joint collaborative R&D for such future technologies.

NAPCC-LIST OF NATIONAL MISSIONS

- National Solar Mission (NSM)
- National Mission for Enhanced Energy Efficiency (NMEEE)
- National Mission on Sustainable Habitat (NMSH)
- National Water Mission (NWM)
- National Mission for Sustaining the Himalayan Ecosystem (NMSHE)
- National Mission for Green India (GIM)
- National Mission for Sustainable Agriculture (NMSA)
- National Mission on Strategic Knowledge for Climate Change (NMSKCC)

LIST OF SCHEMES/ PROGRAMS

SBM 2.0

- SUSTAINABLE SOLID WASTE MANAGEMENT
- SUSTAINABLE SANITATION AND TREATMENT OF USED WATER
- AWARENESS CREATION
- CAPACITY BUILDING

UDAY

- FINANCIAL TURNAROUND
- OPERATIONAL IMPROVEMENT
- REDUCTION OF POWER GENERATION COST
- DEVELOPMENT OF RENEWABLE ENERGY
- ENERGY EFFICIENCY AND CONSERVATION

AMRUT

- ENHANCING WATER SUPPLY SYSTEM
- REHABILITATION OF OLD WATER SUPPLY SYSTEMS
- REJUVENATION OF WATER BODIES
- ARRANGEMENT OF WATER SUPPLY FOR DIFFICULT AREAS
- EFFICIENT SEWERAGE SYSTEM
- REHABILITATION OF OLD SEWERAGE SYSTEM
- REUSE OF WASTEWATER
- IMPROVEMENTS FOR DISASTER MANAGEMENT
- IMPROVEMENT OF NON-MOTORIZED TRANSPORT
- MULTI-LEVEL PARKING
- DEVELOPMENT OF GREEN SPACE AND PARKS

Smart Cities Mission

- EFFICIENT LAND USE
- EXPANDING HOUSING OPPORTUNITIES
- CREATING NON-MOTORIZED LOCALITIES
- PRESERVING AND DEVELOPING OPEN SPACES
- VARIETY OF TRANSPORT OPTIONS
- MAKING GOVERNANCE CITIZEN-FRIENDLY AND COST-EFFECTIVE
- CITY-SPECIFIC IDENTITY
- DEVELOPING SMART SOLUTIONS TO INFRASTRUCTURE AND SERVICES

LIST OF SCHEMES/ PROGRAMS

PMKSY

- INVESTMENTS IN IRRIGATION
- ENHANCE ACCESS TO WATER AND LAND
- EFFICIENT USE AND DISTRIBUTION OF WATER SOURCES
- EFFICIENT WATER USE
- INVESTMENT IN WATER-SAVING TECHNOLOGIES
- SUSTAINABLE WATER CONSERVATION PRACTICES
- INTEGRATED DEVELOPMENT OF RAINFED AREAS
- EXTENSION ACTIVITIES FOR WATER AND CROP MANAGEMENT
- FUNCTIONALITY TO REUSING TREATED WASTEWATER

Majhi Vasundhara

- CONSERVATION & ENHANCEMENT OF GREEN COVER & BIODIVERSITY
- SOLID WASTE MANAGEMENT
- AIR QUALITY MONITORING & AIR POLLUTION MITIGATION
- WATER CONSERVATION
- RAIN WATER HARVESTING & PERCOLATION
- CONSERVATION & ENHANCEMENT OF GREEN COVER & BIODIVERSITY
- CLEANING & REJUVENATION OF WATER BODIES & RIVERS
- TREATMENT OF WASTEWATER
- PROMOTION OF RENEWABLE ENERGY
- AWARENESS OF ENVIRONMENT IMPROVEMENT & PROTECTION
- PLEDGE BY CITIZENS FOR OBSERVANCE OF ONE GREEN ACT

HRIDAY

- PLANNING, DEVELOPMENT, AND IMPLEMENTATION OF HERITAGE-SENSITIVE INFRASTRUCTURE.
- SERVICE DELIVERY AND INFRASTRUCTURE PROVISIONING IN HERITAGE CITIES
- PRESERVE AND REVITALIZE HERITAGE
- DEVELOP AND DOCUMENT A HERITAGE ASSET INVENTORY OF CITIES
- IMPLEMENTATION AND ENHANCEMENT OF BASIC SERVICE DELIVERY WITH A FOCUS ON SANITATION SERVICES.
- LOCAL CAPACITY ENHANCEMENT FOR THE INCLUSIVE HERITAGE-BASED INDUSTRY.
- CREATE EFFECTIVE LINKAGES BETWEEN TOURISM AND CULTURAL FACILITIES
- URBAN HERITAGE ADAPTIVE REHABILITATION AND MAINTENANCE.
- ESTABLISH AND MANAGE EFFECTIVE PUBLIC-PRIVATE PARTNERSHIPS FOR ADAPTIVE URBAN REHABILITATION.
- DEVELOPMENT AND PROMOTION OF CORE TANGIBLE ECONOMIC ACTIVITIES.
- MAKING CITIES INFORMATIVE WITH THE USE OF MODERN TOOLS AND SURVEILLANCE APPARATUS.
- INCREASE ACCESSIBILITY (PHYSICAL AND INTELLECTUAL ACCESS)

LIST OF SCHEMES/ PROGRAMS

Race to Zero

- CREATE INCLUSIVE SOCIETY
- CREATE GREEN AND HEALTHY STREETS
- REDUCE AIR POLLUTION AND ENSURE CLEAN AIR
- DEVELOP ZERO CARBON BUILDINGS
- MOVE TOWARDS A RESILIENT AND SUSTAINABLE ENERGY SYSTEM
- ADVANCE TOWARD ZERO WASTE
- CREATE A SUSTAINABLE FOOD SYSTEM
- DIVEST FROM FOSSIL FUEL AND INVEST IN A SUSTAINABLE FUTURE
- MOVE TOWARDS RESILIENT AND SUSTAINABLE CONSTRUCTION SYSTEMS

Race to Resilience

- RESILIENT BUILDINGS
- DIGITALIZATION (INCLUSION OF VULNERABLE)
- ENERGY (RESILIENT, DECENTRALIZED)
- FOOD SYSTEMS (EXPAND ACCESS, REDUCE WASTAGE, HEALTHY NUTRITION, PLANT-BASED)
- GOVERNANCE AND COMMUNITY ENGAGEMENT (INTEGRATING CLIMATE, SOCIAL AND HEALTH OBJECTIVES)
- NATURE-BASED SOLUTIONS (TREE PLANTATION, GREEN SPACE RESTORATION & CONSERVATION OF ECOSYSTEMS, COASTAL & TERRESTRIAL, LOW CARBON TECHNOLOGIES)
- RISK AND VULNERABILITY PLANNING (INTEGRATIVE INDIGENOUS KNOWLEDGE, WARNING-HAZARDS ADAPTATION MEASURES OF SHOCKS)
- SOCIAL EQUITY
- URBAN-RURAL LINKAGE
- WASTE (COLLECTION, DISPOSAL, CIRCULAR ECONOMY, SAFE SANITATION SERVICES)
- WATER (ELIMINATE POLLUTION, ACCESS TO WATER, DIVERSIFY WATER SOURCES, WATER RETENTION ZONES)

REPORTING FRAMEWORK
CSCAF 3.0

CSCAF

- PERCENT OF GREEN COVER
- ELECTRICITY CONSUMPTION (PER CAPITA)
- RENEWABLE ENERGY FACTOR
- PERCENT OF ENERGY EFFICIENT STREETLIGHTS
- BUA OF GREEN BUILDINGS IN THE CITY
- COVERAGE OF NONMOTORIZED TRANSPORT
- AVERAGE POLLUTION (PM 10)
- AVERAGE POLLUTION (PM 2.5)
- WASTEWATER REDUCE AND RECYCLE
- THE EXTENT OF NONREVENUE WATER
- DISASTER MANAGEMENT PLAN
- CLIMATE ACTION PLAN
- ECBC/ENS TO BUILDING BBYE-LAWS
- WATER RESOURCE MANAGEMENT PLAN
- C AND D WASTE MANAGEMENT PLAN
- PUBLIC TRANSPORT
- POLLUTANT MONITORING
- GREEN BUILDING ADOPTION
- FLOOD WATER STAGNATION AND RISK ASSESSMENT
- ENERGY AUDIT FOR WATER SUPPLY
- BIODIVERSITY MANAGEMENT COMMITTEE
- DISASTER MANAGEMENT CELL
- EARLY WARNING SYSTEM FOR PRIORITY RISKS/HAZARD
- GREEN BUILDING CELL
- FINANCIAL RESOURCES TO PRESERVE WATER BODIES AND OPEN AREAS

Climate Action in Indian Cities: Special Coverage on Climate Action in 5 Cities from Rajasthan & Maharashtra

A study by RCUES, AIILSG, Mumbai

The report covers:

- A study of climate action initiatives taken by 5 cities from 2 states-**Rajasthan**: Jodhpur & Ajmer; **Maharashtra**: Solapur, Sangli & Nanded.
- Best practice case studies on Climate Action under the 3 thematic areas-Energy Conservation, Waste Management & Water Conservation from different states & UTs of India to provide guidance to the ULBs on climate actions.

Contact

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