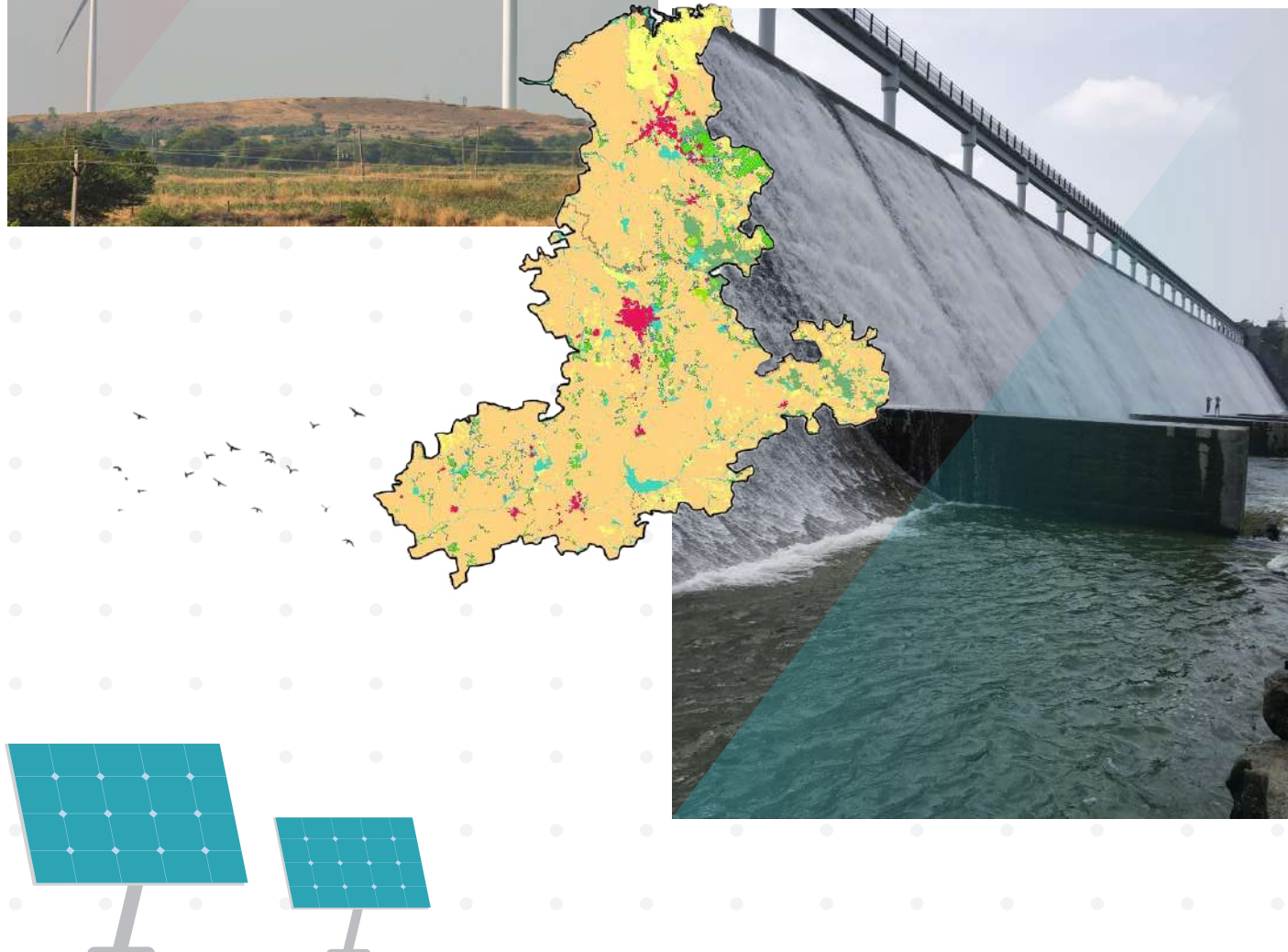




Climate Change  
and Environment  
Action Plan of

# Rajkot District

**Executive summary**



Prepared By



In Association with



Supported By



The Climate Change and Environment Action Plans (CCEAP) have been developed for multiple districts of India by Vasudha Foundation with support from Shakti Sustainable Energy Foundation. For Rajkot, the plan was developed in collaboration with the Climate Change Department, Government of Gujarat and Gujarat Ecological Education and Research (GEER) Foundation, Forests and Environment Department, Government of Gujarat.

The CCEAP aims to complement the State Action Plan on Climate Change (SAPCC) version 2.0 as prescribed by the Ministry of Environment, Forest and Climate Change (MoEF&CC) and align it to India's latest climate commitments to the United Nations Framework Convention on Climate Change (UNFCCC). The rationale behind this action plan is to follow a bottom-up approach to climate-proof development priorities for the district.

**Copyright/ citation:** Climate Change and Environment Action Plan of Rajkot District, Vasudha Foundation, 2022

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**January, 2022**

**Rajkot, Gujarat**

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### Cover page images

#### Top left image:










Wind mills on Rajkot-Amreli highway (sourced from shutterstock)

#### Bottom right:

Reservoir on Aji dam, Rajkot (sourced from istock)

#### Land use map of Rajkot district:

Created using data from Landsat 8, secondary data from NRSC/ISRO Bhuvan portal, Google Earth and ORNL-DAAC

 Forest	 Crop-land	 Built-up Land	 Mixed Forest	 Shrubland
 Fallow-land	 Wasteland	 Water bodies	 Grassland	



Climate Change and  
Environment Action Plan of

# Rajkot District

## Executive summary

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In Association with



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**Kiritsinh Rana**



No. M/F.&E.C.C.P.S./ 344 /2021

**Minister,  
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Date : - 4 JAN 2022

### Message

The state of Gujarat is a front-runner and significantly contributes to the national GDP through various sectors. In addition to this, Gujarat is working to combat climate change and take timely climate mitigation actions. The state currently ranks 1<sup>st</sup> in solar rooftop installed capacity and contributes to 25% of the total national solar rooftop installed capacity. Moreover, Gujarat also stands 3<sup>rd</sup> for total installed renewable power in India.

While state level policies and initiatives are being put in place, a first of its kind, Climate Change and Environment Action Plan for Rajkot district prepared by Vasudha Foundation will aid the district to effectively contribute in state's climate planning. I would like to congratulate Vasudha Foundation and all its partners for formulating a comprehensive district Action Plan that provides doable short, medium and long-term recommendations for various sectors.

I would encourage the district administration and relevant in-line departments to adopt this Action Plan and take initiatives that are climate cognizant.

  
( Kiritsinh Rana )



**Jagdish Vishwakarma (Panchal)**



सत्यमेव जयते

No.Co-Op.C.I.S.I.P.(Ind.)I.F.E.C.C.P.S.(Sta.Mi.) 249/2021

**Minister of State,  
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Industries, Protocol (Independent Charge),  
Industries, Forest, Environment and  
Climate Change, Printing and Stationery  
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**MESSAGE**

Climate change has emerged as a global threat, prompting nations to come together to tackle the challenge. Under the visionary leadership of the Hon'ble Prime Minister, Shri Narendra Modi, India announced its intention to achieve net zero emissions by 2070 at the 26<sup>th</sup> Conference of Parties (COP26) meet at Glasgow, in November, 2021. India has also vowed to reduce the total projected carbon emissions by one billion tonnes, from now onwards until 2030. To achieve these goals, it is imperative that appropriate actions are undertaken at the state level.

The state of Gujarat is a high performing state in terms of environment management besides leading in development and industrial output. The state ranked first in the Composite Water Management Index 2019 (NITI Aayog) for the third year in a row. The city of Rajkot, was in the top 10 'Cleanest Cities with more than a million population' in Swachh Survekshan, 2020. The SDG India Index and Dashboard 2020-21 by NITI Aayog, applauds Gujarat's performance in attaining the Sustainable Development Goals.

Gujarat was the first state in India and Asia, and globally the fourth to form an independent Department of Climate Change back in 2009. I take pride to say that Government of Gujarat believes in development that is sustainable in nature. I am thus delighted to see that a **Climate Change and Environment Action Plan has been developed for Rajkot district**. Developing a plan for the district that factors climate action is a crucial step in the bottom-up approach to meet the state and national climate targets. I am certain that this initiative would set the foundation for tangible actions towards climate conscious development.

I appreciate detailed study undertaken in consultation with various stakeholders to develop the **Climate Change and Environment Action Plan of Rajkot district**. I hope to see the implementation of this Action Plan soon.

**Jagdish Vishwakarma (Panchal)**







**Shri S. J. Haider, IAS**  
**Principal Secretary**  
**Climate Change Department**  
**Government of Gujarat**

### **Message**

Climate Change Department, Government of Gujarat has been actively engaged for over a decade to effectively address climate change. The concerted actions initiated so far have helped bring forth several innovative initiatives for climate mitigation measures, like the installation of solar panels on Narmada branch canals that help generate clean power, while reducing water loss from evaporation. Gujarat is one of the front-runners in renewable energy growth. It ranks first by contributing 25% of the total national solar rooftop installed capacity. Moreover, the Department undertakes different studies from time to time as well as initiatives to enhance State's measures to combat climate change.

In one such endeavour, the 'Climate Change and Environment Action Plans' (CCEAPs) of Ahmedabad & Rajkot Districts have been developed by Vasudha Foundation in collaboration with the Climate Change Department and GEER Foundation. I appreciate the collective efforts put in, for accomplishing this task.

These district Action Plans recognize that there are no universal solutions for climate change. Therefore, regionally appropriate and district-specific Action Plans have been prepared for both the districts. They take into account the district-level baseline studies on: climate variability and projections, emissions profile and budgetary analysis to estimate climate expenditure, and other crucial aspects. They also bring forth a comprehensive set of recommendations for various climate-relevant sectors and environmental issues of the districts, along with case examples and estimated mitigation potential. These Action Plans, I hope, will be of use and relevance in the exercise of district-level planning to integrate climate action with development activities.

**(S. J. Haider)**





सत्यमेव जयते

**U. D. Singh, IFS**  
Director



**GEER FOUNDATION**

Gujarat Ecological Education and Research Foundation

### Message

One of the most challenging threats today is climate change, which has caused regional level disturbances in rainfall, temperature, and extreme events. Countries across the world are realizing the danger posed by this threat and coming together to tackle it. In the most recent Conference of Parties held in Glasgow, India has made many ambitious commitments such as reducing the emissions intensity of its GDP by 45% by 2030 and meeting 50% of its energy requirements from renewable sources in the same timeframe. The most important of announcement was of India to achieve net zero target by 2070.

To meet these targets, particularly net zero by 2070, there is a need to understand the role that forestry sector can play not just as a sink of carbon emissions but also for its myriad ecosystem services for human well-being. The past few Forest Survey Reports have indicated that the recorded forest area in the state of Gujarat, currently standing at 11.03% of the geographical area, has been maintained. Further increase in forest cover, through strategic actions at local level, can reap multiple benefits for the state while combatting climate change in the long term.

In this context, I am pleased to see the efforts made by Vasudha Foundation, in association with the Climate Change Department and GEER Foundation towards developing the 'Climate Change and Environment Action Plan' (CCEAP) for the district of Rajkot. The CCEAP is a detailed study of the district and its priorities in alignment with state and national climate goals. The key takeaway from this action plan is a set of comprehensive recommendations, which can enable the district to mainstream climate action and contribute to India's climate goals. I hope the recommendations in the Action Plan are adopted and implemented by the respective departments.

  
(U.D. Singh)

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# Arun Mahesh Babu

I.A.S

Collector &  
District Magistrate



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Date: 24-01-2022

## MESSAGE

Climate related catastrophic events are on the rise across the world, prompting nations to come together to tackle climate change, which has emerged as a global threat in the past few decades. India has established itself as a world leader in climate action as it recently announced its intention to achieve net zero emissions by 2070 among other ambitious targets at COP26 at Glasgow in November, 2021. To achieve these goals, it is imperative that all the states commence their climate actions immediately and contribute towards the national targets.

In a federal country like India, each state plays an instrumental role in contributing towards national climate goals. Gujarat is one of the leading states in the country in terms of climate action and sustainable development, as seen through several initiatives such as the launch of the latest State Action Plan on Climate Change. The state government has taken a strong stance to reduce emissions from high emitters by announcing curtailment on new thermal power plants. The state also has an all-inclusive EV policy (Gujarat Electric Vehicle Policy, 2021) which focuses not only on a major shift in the automobile segment from fossil-fuel based to electric, but also on supporting infrastructure.

Rajkot is one among the nine cities awarded four-star rating under the Climate Smart Cities Assessment Framework, 2021 by the Ministry of Housing and Urban Affairs. Rajkot city's efforts to reduce carbon dioxide emissions and tackle climate change were recognized by World Wide Fund for Nature as it was awarded the prestigious title of 'National Capital of India 2019-20' for reducing its conventional energy consumption by 17.26 million kWh; the city has won the title three years in a row.

The growing developmental needs in cities, and its peripheries within the district calls for comprehensive sectoral level analyses followed by interventions to curb emissions. Further, adopting a bottom-up approach to climate planning and action can contribute towards achieving the larger goals set by the state and the country. In this light, the Climate Change and Environment Action Plan (CCEAP) of Rajkot district was developed by Vasudha Foundation, in collaboration with Climate Change Department and GEER Foundation. The Action Plan has been developed in consultation with District Administration of Rajkot, officials from relevant departments, academia, civil society organizations and other key stakeholders through multiple rounds of consultation.

I appreciate the efforts made towards developing the CCEAP for Rajkot district. The recommendations given in this Action Plan can be implemented by the relevant departments for mainstreaming climate action in alignment with the district's development priorities.

  
(Arun Mahesh Babu)



# ACKNOWLEDGEMENTS

We would like to thank S.J. Haider, IAS (Principal Secretary), Shwetal Shah (Technical Advisor) and other officials from the Climate Change Department, GoG, and U.D. Singh, IFS (Director), R.D. Kamboj, IFS (Retd.) (former Director), Dr. Sweta Rajpurohit (Manager), and Vibha Goswami (Deputy Director) from GEER Foundation, Forest Department, GoG, as their inputs and support have been vital in development of the Climate Change and Environment Action Plan for Rajkot district.

We are obliged to Arun Mahesh Babu, IAS (District Collector, Rajkot) as well as Remya Mohan, IAS (former District Collector, Rajkot) for their support and motivation to accomplish the completion of the action plan for Rajkot district.

We express our appreciation to V. Subramanian, IAS (Retd.) (former Secretary, MNRE, Gol), for sharing pearls of wisdom during the course of this research.

We extend our gratitude towards other departments and civil organisations – C.N. Pandey, IFS (former PCCF and HOFF, Forest Department, GoG), Dr. D.B. Vyas, IAS (MD, PGVCL), Kartikeya Sarabhai (Director, CEE), and Mahesh Pandya (Director, Paryavaran Mitra) for inputs and suggestions to refine the action plan.

We are grateful to Dr. Ashwini Kulkarni from IITM, Pune and Dr. Koteswar Rao Kundeti for developing the district climate profile and modelling climate change projections for the district.

We would also like to extend our thanks to participants from various academic institutions, CSOs and line departments who contributed to the development and refinement of CCEAP through their inputs during stakeholder consultations.

We are also grateful to Swati Prasad for proofreading and giving the finishing touches to the manuscript, and the team at Aspire Design, New Delhi for designing the final report.

We are thankful to our colleagues from the GIS team, and Energy team at Vasudha Foundation for providing their expertise to assist the research and development of the final action plan.

Last but not the least, we extend our gratitude to Shakti Sustainable Energy Foundation (SSEF), New Delhi, for supporting the endeavour and also to Shubhashis Dey and Aishwarya KS from SSEF.





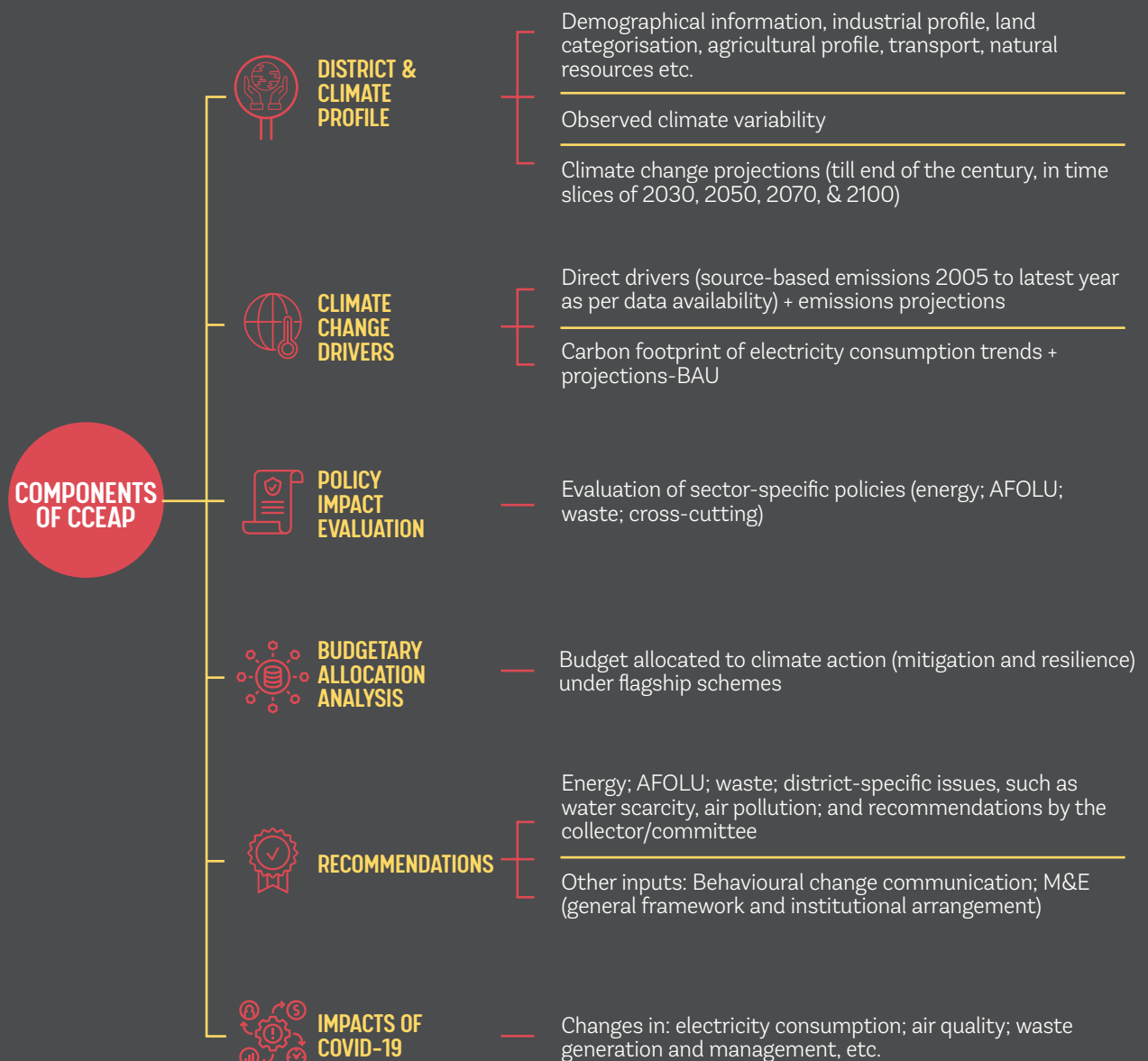
# EXECUTIVE SUMMARY

This Climate Change and Environment Action Plan studies the past, present and the future of the district of Rajkot from both the climate and policy perspective to know where the district stands in terms of meeting India's climate commitments. Based on the findings, it evolves concrete recommendations and the way forward for the district collector and other in-line departments.

The ongoing COVID-19 pandemic made it abundantly evident that anthropogenic activities have a far-reaching impact on the environment. On the flip side though, climate action has received a setback. Several mitigation and adaptation-centric sectors have experienced unforeseen shifts. For instance, an overburdened health infrastructure has not been able to accommodate climate-related health issues. Considerable job losses have further diminished the adaptive capacities of the poor and vulnerable. Moreover, there has been a substantial spike in the waste sector emissions with the rise in covid-related waste incineration and increased disposal of single use plastic.

The action plan, therefore, takes a holistic view of the current policies and recommends steps that need to be taken in the short-, medium- and long-term to bring about the necessary changes that are in compliance with India's overall climate goals and commitments.

The key components of this action plan are summarised in the following chart:



## CLIMATE PROFILE AND PROJECTIONS

In this section, historical data and projected changes in rainfall and temperature for Rajkot district were analysed using IMD and NASA's NEX-GDDP datasets following the multi-modal mean (MMM) approach.

- **Warm days have gone up by 10 percent:** The maximum temperatures in April and May show a significantly increasing trend, which has accelerated in the last two decades. The mean percentage of warm days has also increased by 10 percent in recent years. The winter minimum temperatures also show an upward trend with high variability in the percentage of cold days.
- **Rainy days show more variability:** The seasonal monsoon rainfall does not show any major trend. Variability in rainy days is more in July and August in the recent decade with a slightly decreasing trend observed during 1951 to 2018.
- **Warm days projected to go up by over 53 percent:** Projections indicate that the district will experience warming of 1°C to 2°C under RCP4.5 and 1°C to 4°C under RCP8.5 (between near term and far term/end of century). The percentage of warm days is projected to increase by more than 53 percent. The minimum temperature projects an increasing trend with a decreasing percentage of cold days in all epochs.
- **Rainfall projected to increase:** The seasonal rainfall is projected to increase by 10 to 21 percent under RCP4.5 and 17 to 46 percent under RCP8.5 emission scenarios (between near-term and far-term/end of century) respectively.<sup>1</sup> The number of rainy days is projected to increase during the monsoon season, particularly during July and August.

## SECTORAL GREENHOUSE GAS EMISSIONS PROFILE: CLIMATE CHANGE DRIVERS

- **Greenhouse gas emissions have increased by 52 percent since 2005:** Between 2005 and 2019, the total emissions of Rajkot district increased by 52 percent (from 1.71 million tonnes CO<sub>2</sub>e in 2005 to 2.61 million tonnes CO<sub>2</sub>e in 2019) at a CAGR of 3.04 percent. For Rajkot, the overall increase in emissions is modest (in comparison to other districts) because the energy sector emissions (i.e., emissions from fuel consumption by different categories) for the recent years were lower than 2015. As a result, the CAGR of the economy-wide emissions between 2005 and 2018 was quite low.
- **Energy sector emissions have increased by 64 percent since 2005:** Energy sector (direct fuel combustion in transport, agriculture, residential, industries etc.) is the highest contributor with 59 percent of total emissions in Rajkot. This is followed by agriculture, forests, and other land use or AFOLU sector (33 percent) and waste sector (8 percent). Between 2005 and 2019, the emissions from energy sector in Rajkot have increased by 64 percent (from 0.94 Mt of CO<sub>2</sub>e in 2005 to 1.54 Mt of CO<sub>2</sub>e in 2019). Since Rajkot does not have any electricity generation of its own, the category of transport is the highest contributor to the energy emissions.
- **AFOLU emissions have risen by 39 percent since 2005:** The net emissions of agriculture, forests, and other land use (AFOLU) sector increased by only 39 percent (between 2005 and 2019). However, if the sink created by improvement in forest cover is not considered then the gross emissions of AFOLU sector increased by 77.89 percent. The category 'forest removals' was a source of emissions (till 2015) due to reduction in total forest area. However, the rate of loss of forest area kept decreasing from 2007 onwards. As a result, the emissions from this category kept decreasing as well. With substantial increase in forest area of Rajkot – from 141 sq km to 154 sq km between 2015 and 2017 – the 'forest removals' category became a sink.
- **Waste sector emissions have increased by 36.20 percent since 2005:** Waste sector has witnessed a slow growth (by a CAGR of 2.23 percent; between 2005 and 2019) and the total waste emissions have increased by only 36.20 percent (between 2005 and 2019).

<sup>1</sup> Representative Concentration Pathways (RCPs) are concentration pathways used by the IPCC. They are prescribed pathways for greenhouse gas and aerosol concentrations, together with land use change, that are consistent with a set of broad climate outcomes used by the climate modelling community. The pathways are characterised by the radiative forcing produced by the end of the 21st century. Radiative forcing is the extra heat the lower atmosphere will retain as a result of additional greenhouse gases, measured in Watts per square metre (W/m<sup>2</sup>). There are four RCPs, RCP2.5 (low pathway where radiative forcing peaks at approximately 3 W m<sup>-2</sup> before 2100), RCP4.5 and RCP6.0 (two intermediate stabilisation pathways in which radiative forcing is stabilised at approximately 4.5 W m<sup>-2</sup> and 6.0 W m<sup>-2</sup> after 2100) and RCP8.5 (high pathway for which radiative forcing reaches greater than 8.5 W m<sup>-2</sup> by 2100).

## ASSESSMENT OF POLICIES THROUGH THE LENS OF CLIMATE CHANGE

Around 40 major national/state level policies and programmes of energy, AFOLU and waste sector were evaluated for their climate mitigation potential.

- **Power and energy:** For this sector 13 policies/programmes were evaluated (UDAY and wind energy schemes are the biggest contributors to GHG mitigation)
  - ◀ Policies related to clean energy mitigated 17,96,180 tCO<sub>2</sub>e emissions.
  - ◀ Policies related to energy-efficient buildings and processes helped avoid 55,65,448 tCO<sub>2</sub>e.
  - ◀ Transportation interventions have led to an emission avoidance of 2,68,308 tCO<sub>2</sub>e.
- **AFOLU and cross-cutting:** As many as 11 policies were assessed (nine for AFOLU and two for cross-cutting).
  - ◀ Forestry policies have helped mitigate 5,66,637 tCO<sub>2</sub>e emissions.
  - ◀ Policies pertaining to livestock also proved to be beneficial for climate action, as they helped avoid 1,791 tCO<sub>2</sub>e.
  - ◀ In agricultural sub-sector, impact of only one policy could be computed – the National Food Security Mission added 75,273 tCO<sub>2</sub>e.
  - ◀ The cross-cutting sector policies mitigated approximately 2,87,427 tCO<sub>2</sub>e emissions.
- **Waste:** In the waste sector, a total of 15 policies were assessed.
  - ◀ Policies pertaining to sanitation added 1,14,626 tCO<sub>2</sub>e emissions.
  - ◀ Composting as a part of solid waste management practices has mitigated 4,160 tCO<sub>2</sub>e.
  - ◀ Bio-medical waste incineration caused 135 tCO<sub>2</sub>e emissions.
  - ◀ Domestic wastewater treatment interventions have led to 19,029 tCO<sub>2</sub>e emissions.

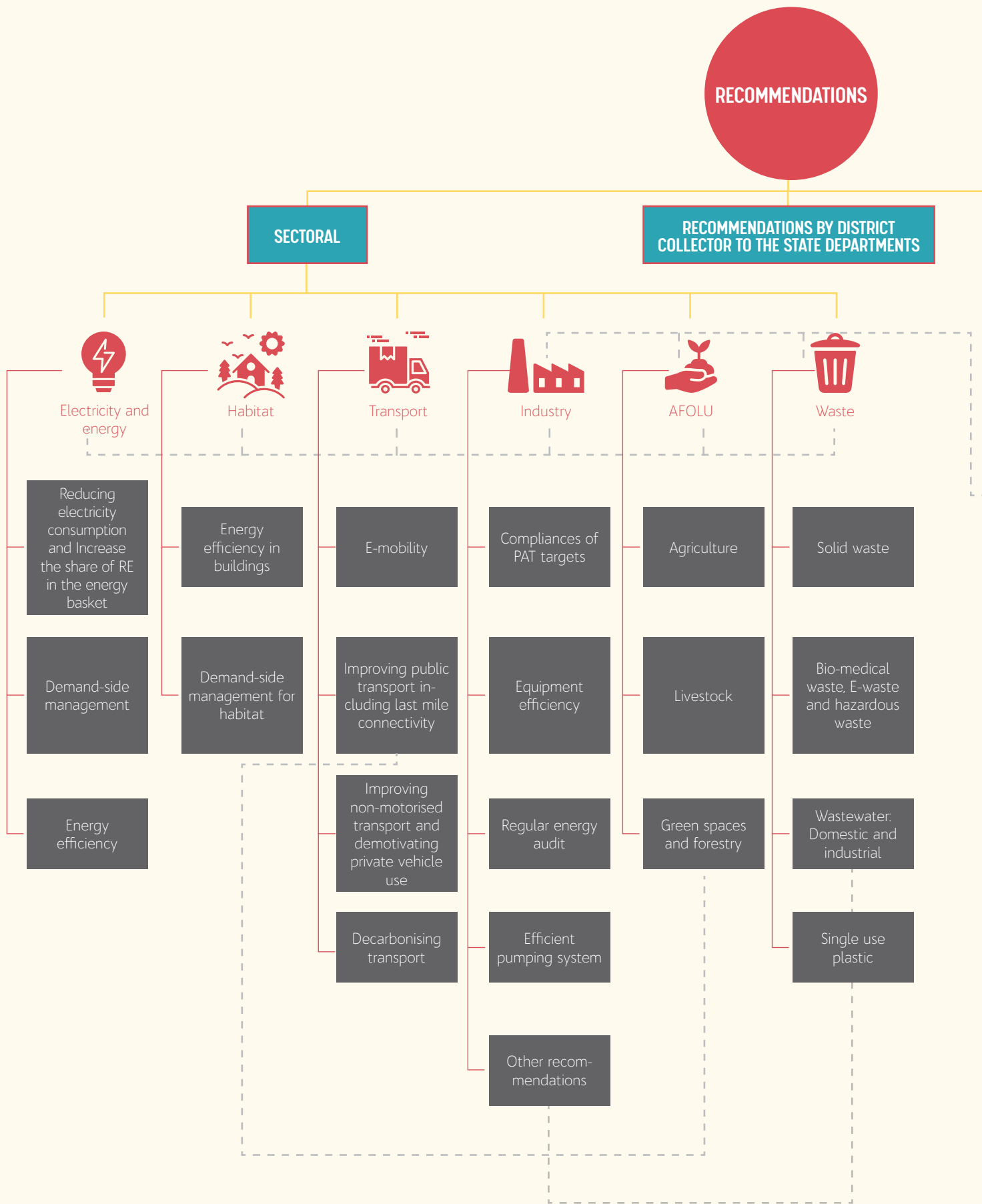
## BUDGETARY ANALYSIS TO ESTIMATE EXPENDITURE ON CLIMATE ACTION

This section analyses the district expenditure to estimate spending on climate action. However, the district budget for Rajkot was not available and the following flagship schemes were analysed for the same. A total of 39 flagship schemes were reviewed to identify those with climate resilience and mitigation relevance. Of these, based on availability of information across districts as well as relevance to climate actions, four schemes were selected for further analysis.

**Table 1: Summary of budgetary analysis of flagship schemes for Rajkot district**

Scheme selected	Climate relevant activities	Year	Total allocation to district under scheme (₹ lakh)	Allocation to climate action (₹ lakh)	% of total scheme budget for climate action at district level
MGNREGS	Eleven out of 17 activities identified as climate relevant – drought proofing, fisheries, flood control and protection, land development, micro-irrigation, renovation of traditional water bodies, rural connectivity, drinking water, sanitation, water conservation and water harvesting	2018-19	47663	10962	23
		2019-20	917	22008	24
PMKSY	Micro-irrigation activities	2016-17	940	64860	*69
		2019-20	1,802	1,243.38	
AMRUT	Water supply, sewage and septage management, urban transport, drainage, green spaces	2015-16	4,617	2,760	*54.5
		2016-17	7,757	3,886	
		2017-20	4,363	2,145	
DDUGJY + Saubhagya	New and upgradation of substations, LT lines, feeder segregation, consumer metering, DTR metering etc	Up to April 2020	3,964	1,982	*50

\*Percentage has been attributed by using Climate Public Expenditure and Institutional Review (CPEIR) methodology of UNDP



**Figure 1: Recommendations for CCEAP Rajkot**

### DISTRICT ENVIRONMENTAL ISSUES



Water scarcity & water pollution



Air pollution

### PROMOTING VOLUNTARY ACTIONS



Lighting



Transport



Housing



Kitchen



Daily use appliance



Waste management



Other recommendations

### BEHAVIOURAL CHANGE COMMUNICATION



Grassroots-communicators as energy ambassadors



Ward/village level Urja Samiti



IEC products



Reward residential societies on environmental performance



Issue specific campaigns using all forms of media



Encourage lifestyle changes

----- : Interlinkages across sectors and sub-sectors (cross-cutting aspects)

## RECOMMENDATIONS

The action plan provides comprehensive, sector-wise recommendations from a climate perspective. The aim is to align the district with India's climate commitments through this Climate Change and Environment Action Plan (CCEAP).

The recommendations factor-in state/district vision documents/development plans. They also list the current policies, programmes and schemes and identify concerned departments that can help streamline the actions. This section also provides information on SDGs and other co-benefits that will be addressed through these recommendations.

Overall, the mitigation actions suggested in the recommendations can help mitigate 8.8 Mt CO<sub>2</sub>e per annum. The sectoral breakdown of the same is as following:

Some in-brief, sector-wise recommendations are provided in figure 1.

### GHG mitigation potential of CCEAP recommendations (tCO<sub>2</sub>e)

 **Energy**  
**25,12,744**

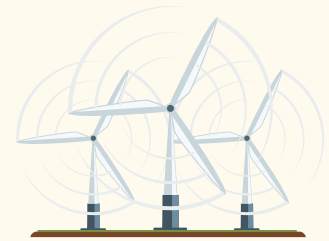
 **AFOLU**  
**62,94,009**

 **Waste**  
**33,534**

### Power and energy

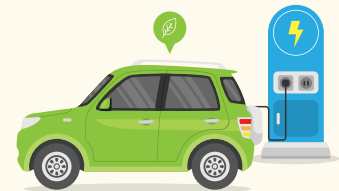
Though the energy sector is crucial to achieving India's growth ambitions, it is also responsible for around 70 percent of the country's annual GHG emissions. This calls for a paradigm shift in the energy sector.

Therefore, the action plan recommends (a) increasing the share of RE generation in the district by advancing on-grid and off-grid solar rooftop, ground-mounted installations and other RE installations; (b) encouraging faster penetration of energy-efficient, star-labelled fixtures and upgrading existing power-grid infrastructure to advanced metering infrastructure (in public, institutional and commercial setups); (c) promoting energy efficiency in the residential sector by encouraging the incorporation of ECBC in the building bye-laws, implementation of India Cooling Action Plan, 2018, etc.; and (d) promoting energy conservation in the industrial sector by introducing measures such as a "cap and trade" system for MSMEs at the district level, encouraging industries to follow the Gujarat Industrial Policy, 2020, etc.



### Transport

Being one of the fastest growing sectors in India, transport contributes 12 percent to India's total GHG emissions. The action plan recommends (a) promoting e-mobility through awareness, increase of e-vehicles' modal share, transition of public transport (PT) and intermediate public transport (IPT) to electric-powered or hybrid vehicles, developing widespread charging infrastructure, incentivising e-vehicle owners, etc.; (b) ensuring last-mile connectivity and promoting increased use of PT and IPT; (c) augmenting non-motorised transport through dedicated cycle lanes; and (d) improving traffic flow.



### AFOLU

For agriculture, forestry, and other land use (AFOLU) sector, it's important to promote climate conscious practices that do not have an adverse impact on the ecosystem, biodiversity and natural resource dependent communities. Our recommendations include: (a) promoting the use of organic fertilisers, solar pumps and practices such as micro-irrigation and alternative ways to manage crop-residue under agriculture; (b) having a good mix of high-yield, cross-breed cattle and indigenous cattle, and encouraging the use of good quality fodder to bring down enteric fermentation emissions; and (c) maintaining the forest area and the tree cover of Rajkot through strict M&E, afforestation in fallow and wasteland, use of alternative funding like CSR, adoption of Miyawaki urban forestry and study on suitability of plantation sites/species, etc. The action plan also recommends involvement of regional agriculture universities to initiate research on high yielding, drought- and temperature-resilient genotypes for various crops, among other measures.



## Waste

With waste sector being one of the biggest contributor of methane emissions globally, major recommendations revolve around reducing landfill disposal of waste and managing wastewater to reduce GHG emissions from them through measures such as: (a) reducing waste at source; (b) proper segregation, collection and channelisation of different categories of waste (including bio-medical waste and e-waste) for recycling and treatment; (c) 100 percent conversion of organic waste to compost and gas management of composting units; (d) recycling, recovery and reuse of 100 percent inert waste (plastic, construction waste, etc); and (e) setting up of centralised aerobic wastewater treatment plants with closed sewer networks and periodical sludge removal facility.



Given the unique environmental issues of the district, the action plan also recommends adopting a holistic approach to water conservation and wastewater management, including conservation techniques such as rainwater harvesting, net zero water infrastructure, minimising losses in water supply, installing water-efficient fittings, water metering and adoption of inclusive and sustainable water governance. Moreover, it recommends developing extensive infrastructure to monitor air pollution and suggestions on interventions for preventive measures.

## COVID-19 IMPACT

This section presents an assessment of how the COVID-19 pandemic has impacted various sectors and the developmental measures. During the national lockdown in 2020, the total energy demand in India went down considerably.

In agriculture, harvesting activities were interrupted due to the lockdown. Supply chain problems were also witnessed. However, the reverse migration proved beneficial for kharif season.

The pandemic has only underscored the need to increase focus on renewable energy and strengthen its integration into the grid. Rajkot district needs to increase implementation of RE generation through solar rooftops, biogas, solar pumps for agriculture and water supply.

Overall, the pandemic resulted in significant reduction in air pollution due to reduced transport and industrial activities during the lockdown and unlock periods. However, the most impacted sector was waste management with single-use plastic waste and bio-medical waste from both households and healthcare sector increasing manifold, leading to increased incineration, landfilling and single-use product consumption.









**Shakti Sustainable Energy Foundation (SSEF)** seeks to facilitate India's transition to a sustainable energy future by aiding the design and implementation of policies in the following sectors: clean power, energy efficiency, sustainable urban transport, climate policy and clean energy finance.



**Vasudha Foundation** is a not for profit organization set up in April 2010 with the belief in conservation of Vasudha, which in Sanskrit means the Earth, the giver of wealth and with the objective of promoting sustainable consumption of its bounties.

The core mission is to promote environment -friendly, socially just and sustainable models of energy by focusing on renewable energy and energy efficient technologies and lifestyle solutions. Climate change mitigation is one of the key verticals of the organization. The focus is to bring about reduction in greenhouse gas emissions in the environment and ensure energy efficiency, energy security, energy independence, and sustainable development as well as simultaneously, promoting the concept of "Low Carbon Solutions" and "Green Economies".



**Climate Change Department**  
Government of Gujarat

**The Climate Change Department**, established in 2009, acts as a bridge within the Government, and between the Government and the Society to address Climate Change. Gujarat is the first and only State in India, the first in Asia and fourth in the world to form an independent department for Climate Change. 'Enabling a low carbon pathway for Gujarat's economic growth that would meet people's aspirations with equity and inclusiveness' is among the department's key objectives. The Department works to address the concerns of Climate Change at State Level by following a multi-pronged strategy, while suitably factoring in National Action Plan on Climate Change (NAPCC), Nationally Determined Contributions (NDCs), Sustainable Development Goals (SDGs), State Action Plan on Climate Change (SAPCC).



**Gujarat Ecological Education and Research (GEER) Foundation** is an autonomous organization set up in 1982 by the Forests and Environment Department, Government of Gujarat. The Foundation undertakes scientific research and studies on various aspects of ecology and nature conservation, including - wildlife, forests, biodiversity and climate change, together with ecological education and extension. The ecological studies and research carried out by the Foundation have created an important source of scientific information and decision making for the Government and other stakeholders. GEER Foundation is also the designated State Center on Climate Change of Gujarat under the aegis of the DST, MoST, GoI.



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