Operationalisation of Climate Studio Project

SDG Focus

- ☐ Goal 2 - Zero hunger
- ☐ Goal 6 - Clean water and sanitation
- ☐ Goal 11 - Sustainable cities and communities
- ☐ Goal 13 - Climate action
- ☐ Goal 15 - Life on land

The Centre for Climate Change and Disaster Management (CCCDM), Anna University houses the Climate Studio established during 2019 with the financial support of Deutsche Gesellschaft fur Internationale Zusammenarbeit) GIZ, Delhi and Operationalised by the Department of Environment and Climate Change, Government of Tamil Nadu. The climate studio is equipped with a high performance Super computer (200TB) along with digital learning accessories, climate related modeling and spatial tools to assess the climate risk and vulnerability on different sectors such as water, agriculture, forestry, coastal resources, etc.

The project "Operationalisation of Climate Studio" demonstrates a localized approach to climate

action. The project provides updated regional climate scenarios and assesses impacts on natural resources, enabling informed decision-making in line with the IPCC framework on Climate Change Risk Assessment. Employing an integrated approach, the study assessed the climate profile and projections for the districts of Tamil Nadu up to 2100 under the SSP2-4.5 and SSP5-8.5 socio-economic scenarios. The risk due to projected climate change is assessed across the sectors such as Water Resources, Agriculture, Forestry, Coastal Area Management and Sustainable Urban Habitat and actionable adaptation strategies, aligning closely with Sustainable Development Goals (SDGs) 13, 14, 15, and 11 respectively.

Acknowledging climate change as a barrier to sustainable development, the project directly addresses SDG 13 by understanding and assessing the hazard, vulnerability, exposure and risk across different sectors viz. water resources, agriculture, forestry, coastal area and urban areas.

By assessing climate change impacts on coastal ecosystems and proposing measures to address erosion and inundation risks, the project contributes to SDG 14. Furthermore, the project's efforts to assess climate change impacts on forests and biodiversity align with SDG 15, promoting the protection and sustainable use of terrestrial ecosystems. Lastly, by focusing on urban habitats and adopting nature-based solutions for climate resilience, the project relates to SDG 11, contributing to the promotion of inclusive, safe, resilient, and sustainable cities and communities. The project prioritizes capacity-building through training programs and workshops, ensuring stakeholders are equipped to address climate-related challenges. This initiative sensitizes over 250 sectoral officials and thousands of participants, laying the foundation for a climate-resilient future in Tamil Nadu.

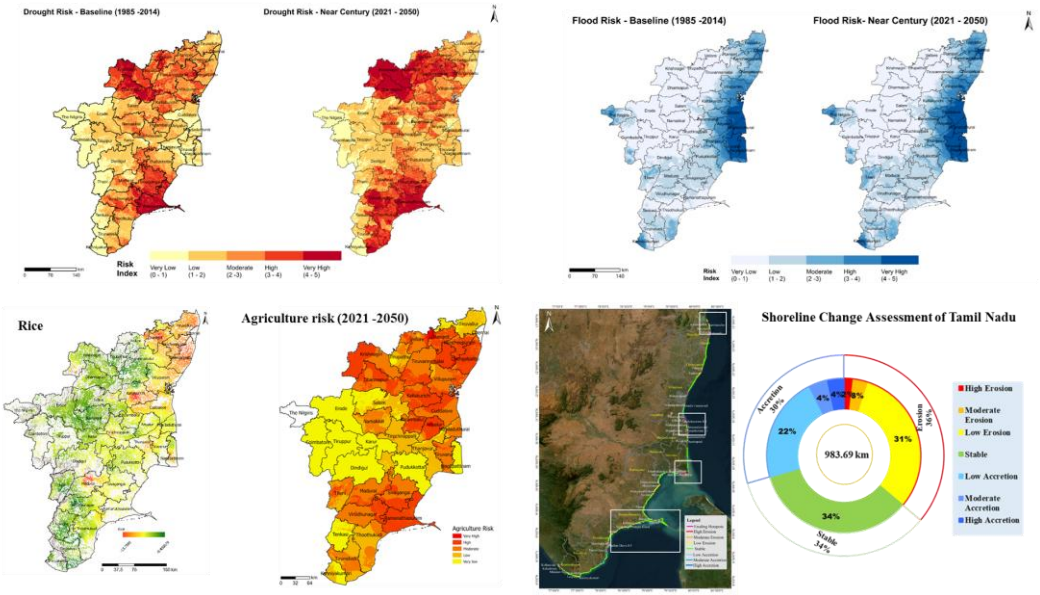

Image: The image shows the drought, flood risk, yield change in rice production, agriculture risk in baseline (1985-2014) and Near Century (2021-2050) and shoreline change assessment in Tamil Nadu

Outline the 3 key benefits of integrating this theme:

1. Informed Decision-Making: The outcome of the climate risk assessment in identifying the most risk prone district in Tamil Nadu across the different sectors aids in climate risk-

informed decision making. The project's integration of scientific methodologies and data analysis enables stakeholders to make informed decisions regarding climate adaptation and mitigation measures. A dedicated interactive web portal is developed to spatially visualize the extent of risk to climate change in the baseline period (1985-2014) and during the near century (2021-2051).

2. Capacity Building and Awareness: Climate Studio has equipped over 250 sectoral officials of the Government line departments like Public Works Department, Agriculture Department, Forest Department, Fisheries Department, Municipal Administration and Town Planning with the necessary knowledge and skills, the project fosters a culture of climate resilience. The stakeholders of all line departments are part of the network and their contact is being developed into a database. Climate studio has reached out to thousands of youth especially school and college students and empowered individuals to actively engage in climate action. Climate Studio has actively participated in 35 District Level Workshops so far, covering around 7000+ participants, conducted by the Tamil Nadu Climate Change Mission and communicated the climate information to the line departments at the districts (https://www.annauniv.edu/cccdm/outreach.html).
3. Tailored Adaptation Strategies: Integrating climate action through the project allows for the development of adaptation strategies specifically tailored to the unique challenges faced by Tamil Nadu.

Image: The collage depicts the awareness training programme to 600 school students conducted by the Centre for Climate Change and Disaster Management

Outline the barriers or challenges encountered in integrating this theme and how you overcame these:

1. Downscaling GCMs to RCMs for sectoral impact assessment for decision-making is a complex task, involves deep learning mechanism. This barrier was overcome by the high performance computing system, primary survey and ground truth verification activities taken up to

accurately assess the sectoral impacts under present and future scenarios.

2. Addressing the informational gaps and connecting different stakeholders is a challenging task which was overcome by the continuous support and data sharing from the Department of Environment and Climate Change and from other sectoral line departments of Government of Tamil Nadu.

What are your conclusions and recommendations for others?

Utilizing projected climatic variables from downscaled GCM data, a nuanced understanding of sectoral risks across the 38 districts of Tamil Nadu under the SSP2-4.5 scenario till the year 2051 was assessed. Notably, the northeastern coastal regions emerge as highly vulnerable, to extreme weather events during the northeast monsoon, pluvial floods, cyclones, and sea-level rise, exacerbating agricultural losses due to prolonged water stagnation. Within this context, districts like Mayiladuthurai, Tiruvarur, Kancheepuram, and Nagapattinam confront particularly elevated risks. Conversely, the lower delta regions, such as Pudukottai, Sivagangai, and Ramanathapuram, experience comparatively lesser impacts from coastal hazards. Areas surrounding the Western Ghats exhibit lower vulnerability, benefitting from dense forests with robust carbon sinks. Regions like Palghat Pass, Sengottai Pass, and Kanyakumari Aralvaaimozhi Pass receive substantial rainfall from both monsoon seasons, enhancing their resilience.

Recommendations:

- Based on climate risk information emanating from the climate studio study it is recommended to formulate District Climate Change Action Plan (DCCAP) in line with the Tamil Nadu State Action Plan on Climate Change.

- Disseminate knowledge on climate risk and action plans to different stakeholders and the scientific community through establishing District Level Climate Action Information Centre.

- Providing robust inventories on carbon sequestration potential in reserve forest and private lands to enhance carbon sink as a nature based solution.

- Sharing climate knowledge, vulnerability and risk through suitable application in the mobile platform so as to increase our capacity on climate resilience involving community as a whole.