# Workshop on the Sustainable Alternative Futures for India (SAFARI) Model

**Venue: Magnolia Hall, India Habitat Centre, New Delhi**

**Time: 9:30 am to 1:30 pm**

## Event Summary

"India is in a unique position to set sail on a low-carbon development path in pursuit of its developmental goals," said Dr Anshu Bharadwaj, Executive Director, CSTEP. He was speaking at the Sustainable Alternative Futures for India (SAFARI) model launch in New Delhi. Elaborating on the genesis of the model, Dr Bharadwaj highlighted the need for bottom-up estimation of demand of various materials and energy and resource constraints that will impact India's developmental ambitions. He also stressed on the need for India to decouple GDP growth from emissions growth

CSTEP researchers Ramya Natarajan, Poornima Kumar, and Kaveri Ashok presented key insights from the project—including the SAFARI tool—and provided a live demonstration of its capabilities. The developmental goals considered in the model include food, housing, healthcare, education, water, transport, and power for all. The model allows policymakers/researchers to consider various resource constraints and arrive at sustainable ways of achieving the goals at lower energy and water demands through behavioural, policy, and technology interventions. The key behavioural changes explored in the model include shift to public transport and dietary shift towards millets from rice. Some of the main policy interventions include increasing area under micro-irrigation, higher use of solar pumps for irrigation, biofuel blending in the transport sector, and use of clean cooking fuels. Using alternative construction materials that have lower embodied energy and emissions is an example of technology interventions explored in the model.

Illustratively, the tool indicates that water constraints could mar India's food security goal with a reliance on rice- and wheat-based diets while simultaneously increasing energy demand due to water-pumping needs. The model suggests a need to transition to coarse grains to mitigate this constraint.

The presentation was followed by two panel discussions (detailed below) that provided detailed comments and suggestions for consideration in the next phase of the project.

## Panel 1: India's 2050 climate strategy, SDGs, and the workability of decision-support systems to policymakers

The first panel included Dr JR Bhatt (Advisor, Climate Change, MoEFCC), Mr Jigmet Takpa (Joint Secretary, MoEFCC), and Mr Siddharth Pathak (2050 Pathways Platform), and was moderated by Ms Shweta Srinivasan, Research Scientist (CSTEP). Some of the key discussion points are listed below:

- Dr Bhatt said that for the goals considered, while international standards should be looked at—for instance, Organisation for Economic Co-operation and Development (OECD) averages—analysis was needed to ensure that the benchmarks considered are context-specific to India. The tool can yield useful analysis on this, and would be relevant in drafting policies.

- Mr Takpa highlighted that the nexus approach—where land and water as resource constraints are considered and modelled—is increasingly important. Land is a major thrust area for India since the UNCCD COP14 event and taking into account the competing uses for land as well as land degradation is a key consideration when thinking about India's development goals.
- Data on land-water-natural resources and analytical insights are required to make long-term policy decisions. For this, tools like SAFARI can be used.
- Based on international experience, several stakeholders suggested that such nexus models should remain 'open' as opposed to traditional 'black box' models used in energy-environment modelling, to permit policymakers to assess alternative scenarios.
- Other suggestions included extending the model to assess scenario impacts on livelihood and economic drivers of demand / development aspirations, as well as exploring the implications of trade linkages and climate shocks.

## Panel II: Way forward for SAFARI and modelling India's future sustainability considerations

The second panel included Mr Ajay Raghava (Deputy Director, Climate change, MoEFCC), Dr Simi Thambi (Programme Officer, MoEFCC), Dr Ulka Kelkar (Director, Climate, WRI), Mr Karthik Ganesan (Research fellow, CEEW), and Mr Vaibhav Gupta (Manager, Energy & Mines, Cement Manufacturers Association), and was moderated by Mr Priyavrat Bhati, Sector Head (Climate and Environment) from CSTEP. Some key discussions points are listed below:

- Mr Ajay Raghava suggested that transformative technologies and transitions be considered in long-term modelling.
- Modelling tools like SAFARI could help expose some of the unintended or hidden consequences of policies. Dr Simi Thambi explained how, for instance, the impact of solar pumps on groundwater extraction should be looked at with a regional perspective, rather than solely from an electricity and emissions perspective.
- Regarding challenges associated with changing behaviours, Dr Ulka Kelkar suggested that the results could be framed as 'impact on people' rather than 'impact on resources'. For instance, establishing the impact of dietary shift to millets on farmers' livelihoods would be an important aspect to explore, and the agriculture story could be articulated in a farmer-centric manner.
- Such bottom-up demand estimation models are useful to the cement industry for long-term planning, observed Mr Vaibhav Gupta. He also commented on the aspect of circularity or circular economy in the cement industry—increase in thermal substitution rates and the impact on landfill reductions, which the model could also explore.

Finally, Dr Bhatt thanked the 2050 Pathways Platform and Agence Francaise de Developpement (AFD) for extending financial support to this study and acknowledged the role of the participants in enriching the discussions.