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(57) Abstract :
Abstract This invention presents an innovative tool designed to accurately assess the localized and sector-specific impacts of climate change. Traditional climate models often focus on broad, generalized predictions that fail to capture the unique effects of climate change on specific regions, industries, and communities. This framework addresses that gap by integrating diverse data sources, including meteorological, hydrological, socio-economic, and ecological data, to provide more precise and actionable predictions. A key feature of the invention is its ability to continuously update its models using real-time data, allowing for adaptive and dynamic simulations that reflect evolving climate conditions. This adaptability ensures that the framework remains relevant over time, providing decision-makers with current and reliable information for climate adaptation and mitigation efforts. The framework also incorporates localized assessments, allowing users to understand the specific impacts of climate change in their region or sector, such as agriculture, infrastructure, or public health. By employing advanced mathematical algorithms and simulations, the framework can model the effects of climate phenomena like temperature fluctuations, changing precipitation patterns, and rising sea levels on various socio-economic and environmental systems. It provides valuable insights into how climate change will affect agricultural yields, water resources, urban infrastructure, and human health, helping stakeholders make informed decisions. The invention supports targeted climate resilience strategies, sustainable development planning, and disaster preparedness, offering an essential tool for governments, businesses, and research institutions working to mitigate the impacts of climate change.

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