



Home



Network



Jobs



Messaging



Notifications



Me ▼



For Business ▼

[Edit article](#)[View stats](#)[View post](#)

Why climate resilience requires integrated water security, renewable energy, sustainable infrastructure, and effective risk management.

**Rajesh Sathyanarayana**Technology & Operations Executive | IP & Compliance |
Strategic Growth & Business Leadership

October 16, 2026

What happens when water becomes scarce just as electricity demand begins to rise?

India faces an important challenge as it prepares for the potential impacts of a strong El Niño. An article published by *The Economic Times* on 14 October 2026 highlighted concerns about water availability, agricultural conditions, electricity demand, and heat risks following a monsoon season that recorded a 12.6% rainfall deficit. It also discussed the possibility of a hotter summer in 2027. These are potential risks, not inevitable outcomes. El Niño does not determine India's rainfall on its own, and its effects can vary significantly across regions. Nevertheless, these developments raise an important question about **India's climate resilience, water security, and energy security**. Are our water, energy, and agricultural systems sufficiently prepared to manage climate uncertainty and periods of environmental stress?

1. Water Security and Energy Security: Why They Must Be Planned Together

Water security and energy security are closely interconnected. Water requires energy for pumping, treatment, and distribution, while agriculture depends on reliable energy for irrigation. At the same time, some electricity-generation technologies require substantial quantities of water. This interdependence creates risks for essential services and economic activity. Water scarcity can affect drinking-water availability, agricultural productivity, and industrial operations. It can also place

pressure on electricity generation. Conversely, unreliable or expensive energy can make water distribution and agricultural irrigation more difficult. **Water infrastructure and energy infrastructure cannot be planned effectively in isolation.** India's long-term climate resilience will depend partly on how effectively these interconnected systems are designed, managed, and maintained to withstand periods of water stress and rising energy demand.

2. Sustainable Infrastructure: Does It Deliver Resilience When It Matters Most?

Through my professional experience with irrigation projects undertaken for the Government of Karnataka, including major and minor irrigation programmes and NABARD-funded projects, I gained an appreciation of the role water infrastructure can play in addressing rural water scarcity. Some of these projects focused on replenishing lakes and tanks that had dried up during periods of drought, with the objective of improving water availability for local communities. These experiences highlight a broader question about sustainable infrastructure development. A lake can be rejuvenated. An irrigation network can be completed. A reservoir can be constructed.

But how effectively do these assets improve long-term water security when rainfall is inadequate and demand increases?

The answer depends on more than construction. Water availability, infrastructure maintenance, groundwater conditions, efficient water distribution, and responsible resource management all influence long-term outcomes. Infrastructure resilience must therefore be evaluated not only under normal operating conditions but also during periods of climate stress. For governments, infrastructure developers, and other stakeholders, the challenge is to ensure that public infrastructure investments deliver lasting benefits to farmers, communities, and local economies.

3. Renewable Energy and Groundwater Management: Avoiding Unintended Consequences

Renewable energy offers significant opportunities to strengthen India's energy security and support climate resilience. Solar power can support agricultural irrigation and reduce dependence on conventional electricity sources. Wind and solar energy can also contribute to a more diversified electricity system. However, renewable energy development must be considered alongside sustainable water management. Solar-powered irrigation may improve access to energy, but if groundwater extraction is not managed responsibly, easier access to pumping can increase pressure on already stressed aquifers. An intervention designed to improve energy access could therefore create an unintended water-management challenge. The solution is to integrate renewable energy with sustainable groundwater management, efficient irrigation practices, and local water-resource planning. **Clean energy and sustainable water use must advance together.** Climate resilience requires solutions that consider not only the immediate benefits of a technology but also its long-term environmental and economic consequences.

4. Climate Risk Management: Turning Forecasts into Practical Preparedness

Climate forecasts provide an opportunity to prepare for potential risks before they materialise. However, forecasts alone cannot protect communities or ensure continuity of essential services. Effective climate risk management requires practical decisions about:

- Water allocation and reservoir management.

- Drinking-water security and drought preparedness.
- Agricultural planning and irrigation requirements.
- Electricity demand and energy supply resilience.
- Maintenance of critical infrastructure.
- Emergency response and protection of vulnerable communities.

It also requires coordination among government agencies, infrastructure operators, energy providers, agricultural institutions, and local communities. The central challenge is not simply to identify climate risks. It is to translate available information into decisions, responsibilities, and actions that reduce vulnerability. For businesses and public institutions, this is also a matter of **risk management, accountability, and governance**.

Are risks assessed in advance? Are responsibilities clearly defined? Are critical assets maintained? Are outcomes monitored? Can decision-makers identify potential failures before they become costly disruptions? These questions connect climate adaptation and environmental sustainability with effective infrastructure planning and responsible decision-making.

5. Measuring Climate Resilience: Beyond Infrastructure Construction

How should India measure the success of investments in water infrastructure, renewable energy, and climate adaptation? Infrastructure development is often discussed in terms of expenditure, capacity created, or projects completed. These measures are important, but they do not tell the entire story. The effectiveness of sustainable infrastructure should also be assessed through measurable outcomes, including:

- **Water security:** Reliability of drinking-water and irrigation supplies during periods of stress.
- **Groundwater sustainability:** Water extraction patterns and the long-term condition of aquifers.
- **Energy security:** Continuity and reliability of essential electricity services.
- **Resource efficiency:** Efficient use of water and energy.
- **Infrastructure resilience:** Maintenance, operational readiness, and performance of critical assets.
- **Social impact:** Protection of vulnerable communities and rural livelihoods.
- **Environmental sustainability:** Long-term effects on water bodies, ecosystems, and natural resources.

The appropriate indicators will depend on the project, location, and intended outcomes. They should be supported by reliable data and clear performance objectives. Nevertheless, the principle is straightforward:

The value of infrastructure lies not only in the capacity it creates, but also in its ability to continue delivering essential services when conditions become difficult.

This approach also strengthens ESG governance by connecting environmental performance, community outcomes, risk management, and accountability with the actual results of infrastructure investments.

The Bigger Question: Is India Investing Enough in Climate Resilience?

India's response to climate uncertainty cannot depend on isolated interventions.

Water security, renewable energy, sustainable agriculture, environmental protection, and infrastructure governance must work together. Decisions in one area can have consequences for another, making coordinated planning increasingly important. The potential El Niño event provides an opportunity to examine these connections before future climate stresses test our systems. We may not be able to control rainfall or eliminate climate uncertainty. But we can improve how we prepare, allocate resources, maintain infrastructure, and measure results. For professionals working in infrastructure, energy, agriculture, sustainability, and corporate governance, this raises an important question:

Are we investing enough in climate resilience, or are we still measuring progress by the infrastructure we build rather than the risks we are able to withstand?

I welcome your perspectives.

Comments

1

  Like  Comment  Share

Add a comment...

No comments, yet.
Be the first to comment.
[Start the conversation](#)



Rajesh Sathyanarayana

Technology & Operations Executive | IP & Compliance | Strategic Growth & Business Leadership

About
Professional Community Policies
Privacy & Terms
Sales Solutions
Safety Center

Accessibility
Careers
Ad Choices
Mobile

Talent Solutions
Marketing Solutions
Advertising
Small Business

 **Questions?**
Visit our Help Center.
 **Manage your account and privacy**
Go to your Settings.
 **Recommendation transparency**
Learn more about Recommended Content.

Select Language
English (English)