2025 GLOBE Regional Meeting for Asia and Pacific
05 – 07 May 2025, Virtual

"Bridging Generations of GLOBE GISN Scientists: Leveraging GISN Tools for Soil Moisture and Earth System Science Data Collection"

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Mr. Yashraj Patil

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- Assistant Professor at SNJB's College of Engineering, Chandwad, (Nashik) India
- In-charge of The GLOBE Lab at SNJB COE, India
- PhD Scholar at Symbiosis International University, Pune, India
- Chancellor's Gold Medalist in Post Graduate Programme
- GLOBE GISN Scientist/Researcher, GLOBE Program
- UNITAR Global Diplomacy Fellow, UNITAR New York
- UN General Assembly Science Summit Distinguished Speaker

" Research demands Resilience and the Courage to follow Curiosity wherever it leads "

Session Outline

1. Understanding GISN
2. Power of Science Diplomacy
3. Focus Case: Soil Moisture Monitoring
4. Earth System Science Integration through GISN
5. Ways GISN Members Engage and Support

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Understanding GLOBE International STEM Network (GISN)

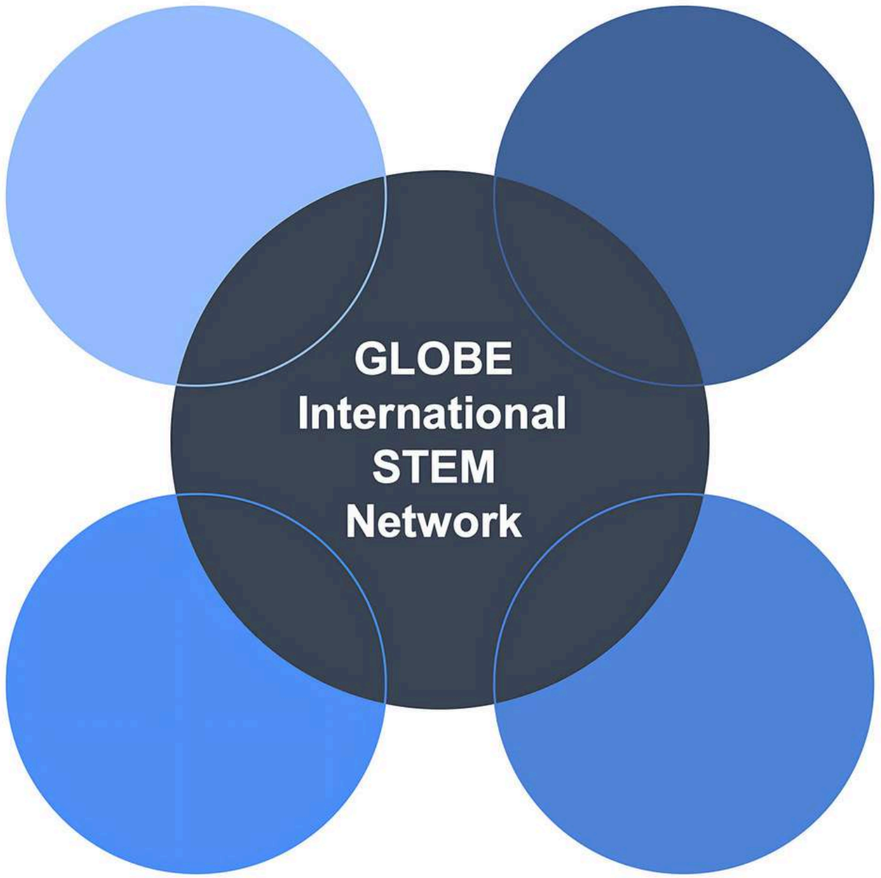
A global community of STEM professionals collaborating with students and educators to support environmental research and literacy.

GISN are the Scientists, engineers, researchers, educators, and other STEM professionals committed to advancing global science education.

GISN's Collaborative Framework

Educational Empowerment

Empowers students to contribute to scientific data and become future scientists.



STEM Professional Engagement

Connects professionals with students and educators for mentorship and guidance.

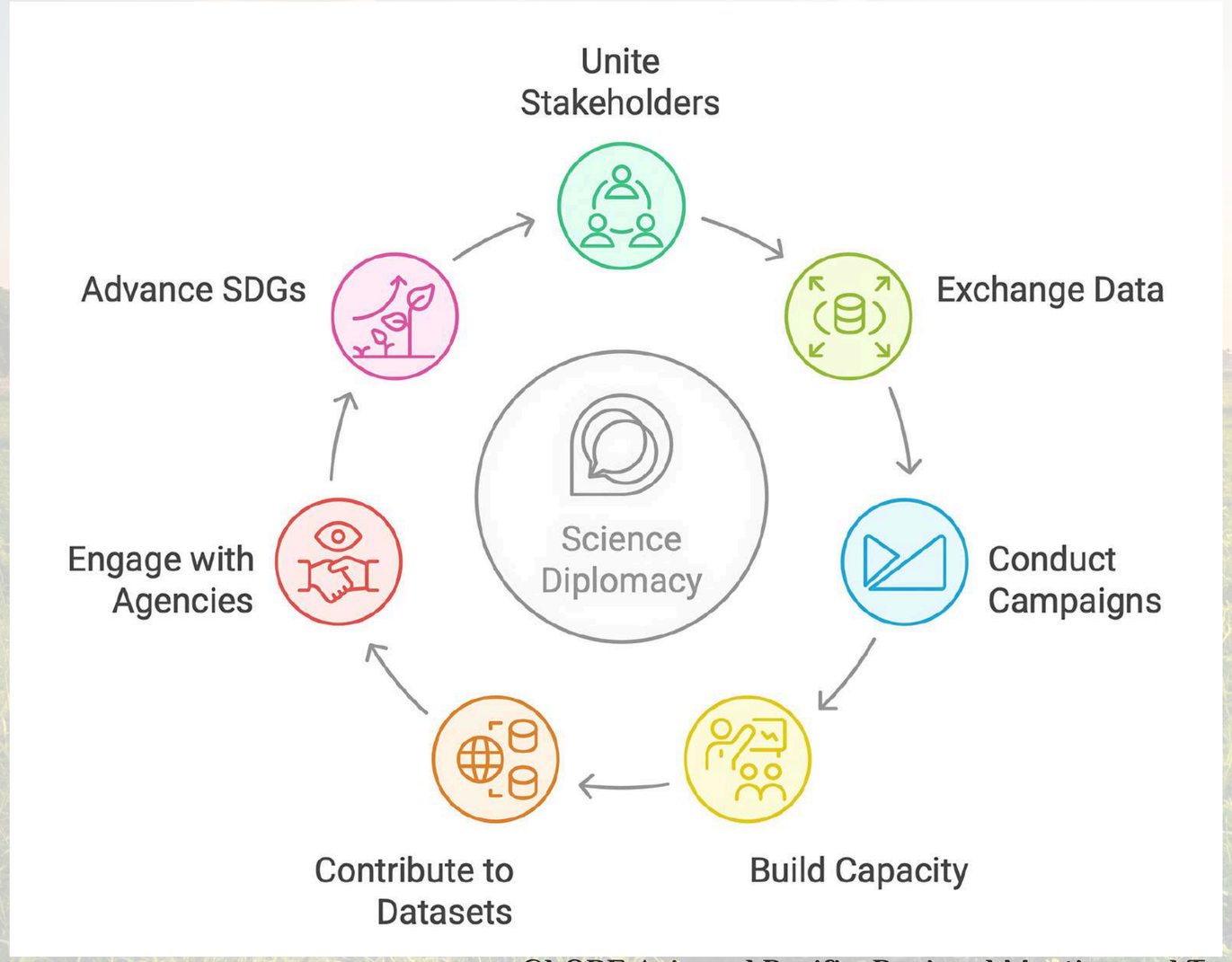
Data Collection and Analysis

Emphasizes hands-on data collection using standardized protocols.

Collaborative Research

Fosters joint research projects between professionals and students.

Power of Science Diplomacy



Focus Case: Soil Moisture Monitoring

Tool/Resource	Description	GISN Role	Impact on Soil Moisture Monitoring
GLOBE Soil Moisture Protocol	Standard method to measure gravimetric soil moisture (wet vs. dry weight).	**Guides students in standardized data collection.**	Enables global comparison of soil moisture data; ensures scientific accuracy.
GLOBE Data Entry & Visualization Tools	Web portal to input, access, and visualize GLOBE soil data.	**Researchers access, validate, and use student data in research.**	Enhances data transparency; supports trend analysis and real-world application.
GLOBE Observer App (Land Cover Tool)	Mobile app for capturing site photos and land cover types.	**GISN members use it to cross-reference land characteristics.**	Supports contextual interpretation of soil moisture (e.g., vegetation impact).
SMAP-GLOBE Soil Moisture Campaign	Collaboration with NASA's SMAP satellite to ground-truth data.	**GISN scientists guide campaign, ensure protocol alignment, and use data.**	Boosts satellite data reliability; engages students in international science.
Webinars & Mentorship Resources	Training sessions and guides for students and educators.	**GISN experts lead sessions, offer research mentorship, and judge projects.**	Builds scientific capacity and encourages inquiry-based learning.

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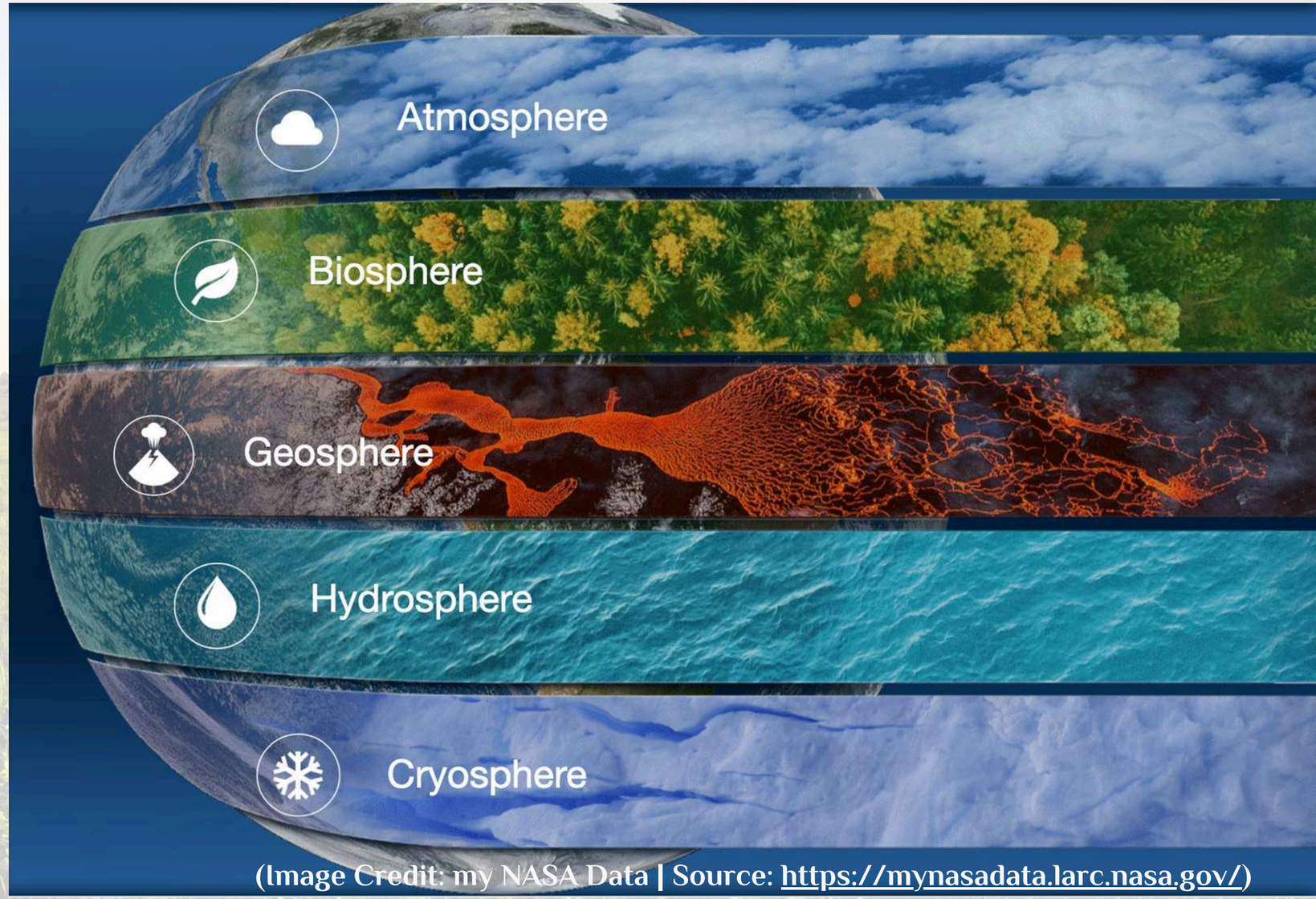
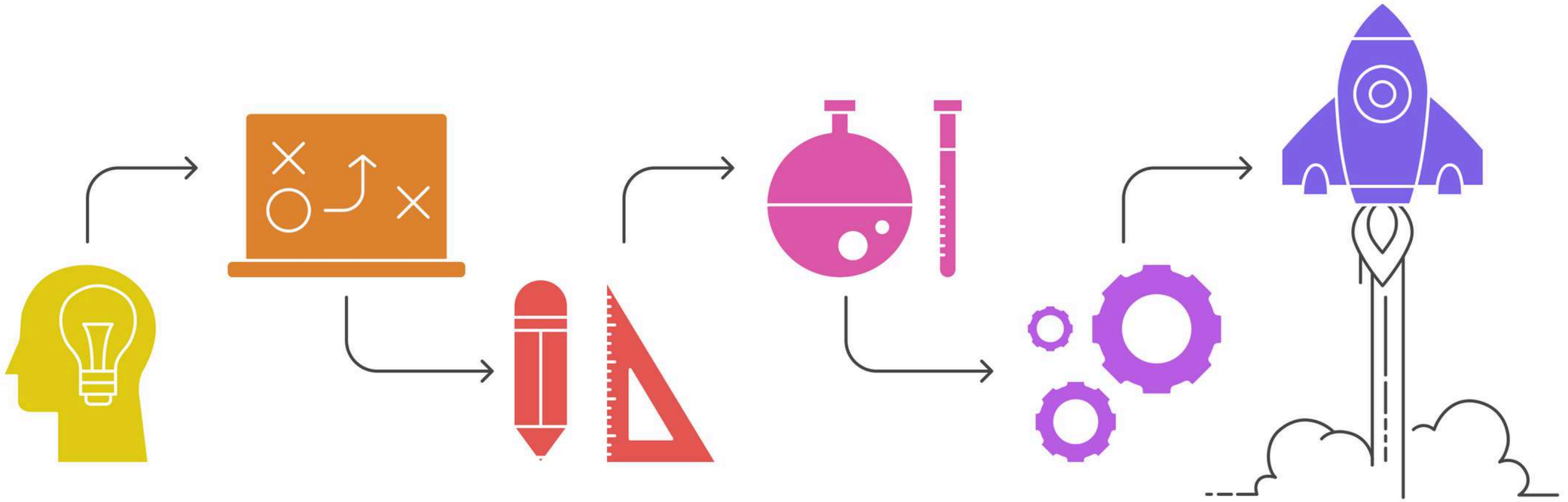
Earth System Science



(Image Credit: my NASA Data | Source: https://mynasadata.larc.nasa.gov/)

GISN: A Systems Thinking Approach to Environmental Education

- **GISN**
  - **Systems Thinking**
    - Climate
    - Water
    - Land
    - Life
    - Human Activities
  - **Transdisciplinary Learning**
    - Geosciences
    - Technology
    - Engineering
    - Social Sciences
  - **New Model of Education**
    - Contributors to Science
    - Resilience Thinking
    - Sustainability Planning
    - Citizen Diplomacy
  - **Feedback Loops**
    - Data Visualization
    - Analysis
    - Validation
    - Global Models
  - **Real-Time Data**
    - Data Collection
    - Interpretation
    - Solutions



Textbook Learning

Passive consumption of knowledge

Data Collection

Gathering localized environmental information

Visualization

Displaying data for easy understanding

Analysis

Interpreting data within system context

Validation

Ensuring data accuracy and reliability

Global Modeling

Integrating data into broader models

GISN Role

Ways GISN Members Engage and Support

	Mentoring	Science Fairs	Campaigns	Webinars	Research	Collaboration
Guide	Guide research projects	Serve as judges	Co-lead campaigns	Host virtual talks	Integrate student data	Build research relationships
Support	Support inquiry-based learning	Encourage scientific rigor	Facilitate local data collection	Build environmental literacy	Publish co-authored studies	Serve as ambassadors

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2024 GLOBE Europe & Eurasia Regional Meeting

Example of GISN GLOBE Inter-Regional Collaborations

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Digital Tools for Proactive Engagement

Login/ Signup

Resources

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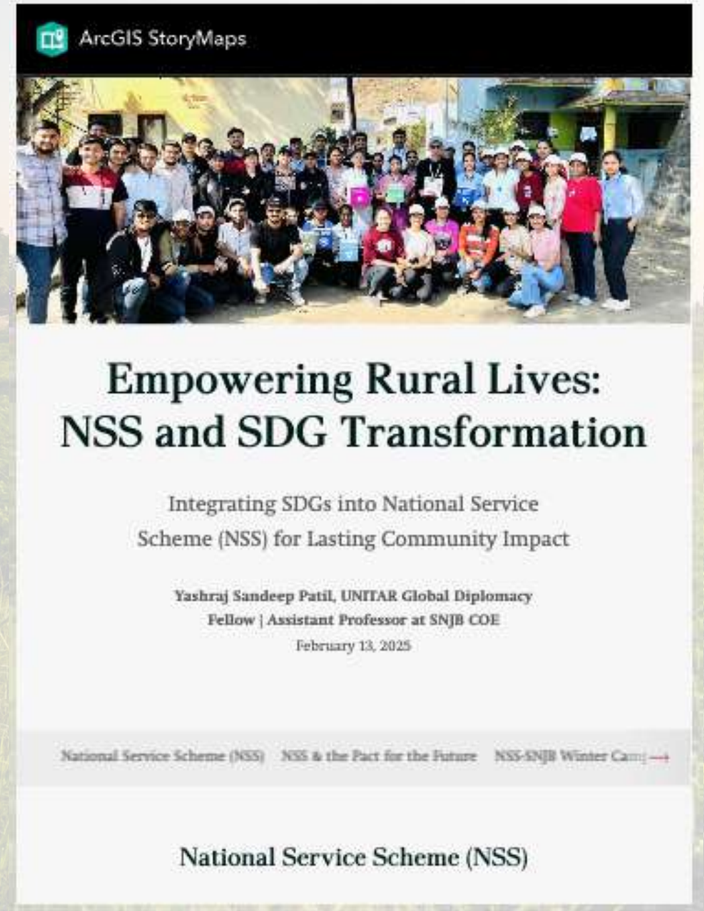
Digital Tools for Proactive Engagement



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Digital Tools for Proactive Engagement

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Resources

Digital Tools for Proactive Engagement

Storytelling Power Aspect	ArcGIS StoryMaps	Canva
Engagement	Immersive map-based exploration of GLOBE data	Eye-catching, easy-to-digest visuals
Connection to Real-World	Shows environmental data across locations, enhancing relevance	Simplifies complex data, making it relatable and memorable
Emotional Impact	Highlights the scale and reach of GLOBE's global data	Creates visually appealing designs that resonate with viewers
Audience Accessibility	Engages those interested in geographic detail	Accessible for all audiences, including non-scientists
Inspiration to Act	Encourages exploration and deeper understanding	Simplifies calls to action, ideal for awareness and outreach
Best Storytelling Use	Sharing environmental impact stories with data-backed maps	Summarizing projects, infographics, and impactful visuals

Digital Tools for Proactive Engagement

Step	GLOBE Scientific Data Storytelling	GLOBE Activity Storytelling
1. Define Story's Structure	Select critical data points (e.g., CO_2 levels, temperature changes) and central scientific theme.	Choose a GLOBE-relevant topic and identify specific data points (e.g., water quality data) to showcase.
2. Contextualize Data	Explain the importance of data with real-world relevance (e.g., "Rising temperatures affect biodiversity").	Show how the data supports an environmental story. Prepare engaging visuals to make data relatable.
3. Create Visuals in Canva	Design infographics, charts, and icons in Canva that clarify trends and comparisons.	Use Canva templates to create simple visuals, such as infographics for GLOBE data, with a focus on accessibility.
4. Export Canva Visuals	Export visuals as high-quality JPEG, PNG, or PDF files for seamless integration into StoryMaps or the presentations.	Download Canva visuals in suitable formats for StoryMap use and organize files for easy access.
5. Build the	Embed visuals and add maps or charts that display	

Digital Tools for Proactive Engagement

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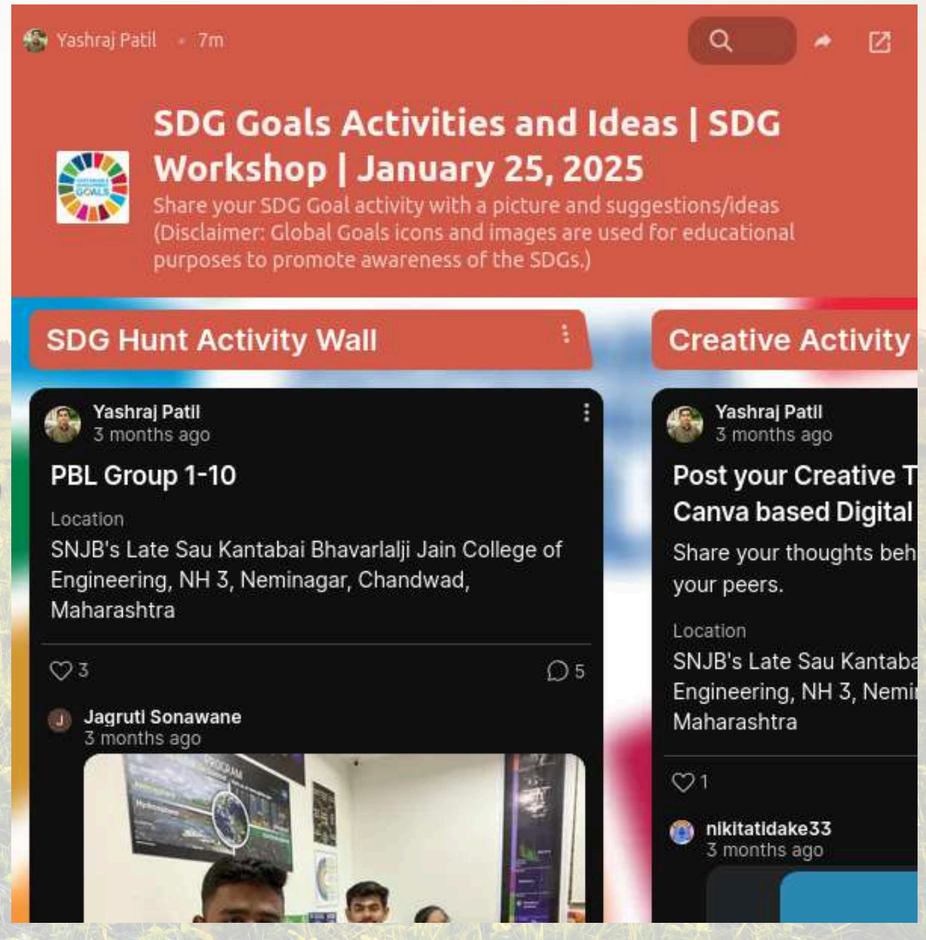
:Padlet

https://padlet.com



https://padlet.com/patilyscoe/snjbcoesdgworkshop

Pilot Project for Inter-University Collaboration

The GLOBE Lab is an initiative aimed at implementing The GLOBE Program widely at institutes, universities, engaging students, teachers, and scientists in data collection and the scientific process. It fosters a culture of scientific inquiry, environmental stewardship, and global citizenship.

Pilot Project for Inter-University Collaboration

Vision

To inspire and empower the next generation of global citizens through scientific inquiry, environmental stewardship, and collaborative research, fostering a sustainable future for our planet.

Mission

To provide students, educators, and researchers with the tools, resources, and support needed to actively participate in The GLOBE Program, advancing scientific literacy, environmental awareness, and global collaboration.

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Our Goal

Build local teams from universities and colleges who observe the sky in a disciplined, scientific way and use data to protect their environment.

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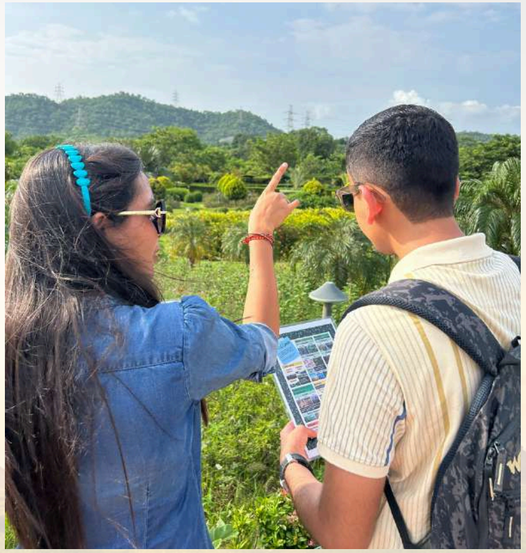
From GLOBE Lab to the Fields



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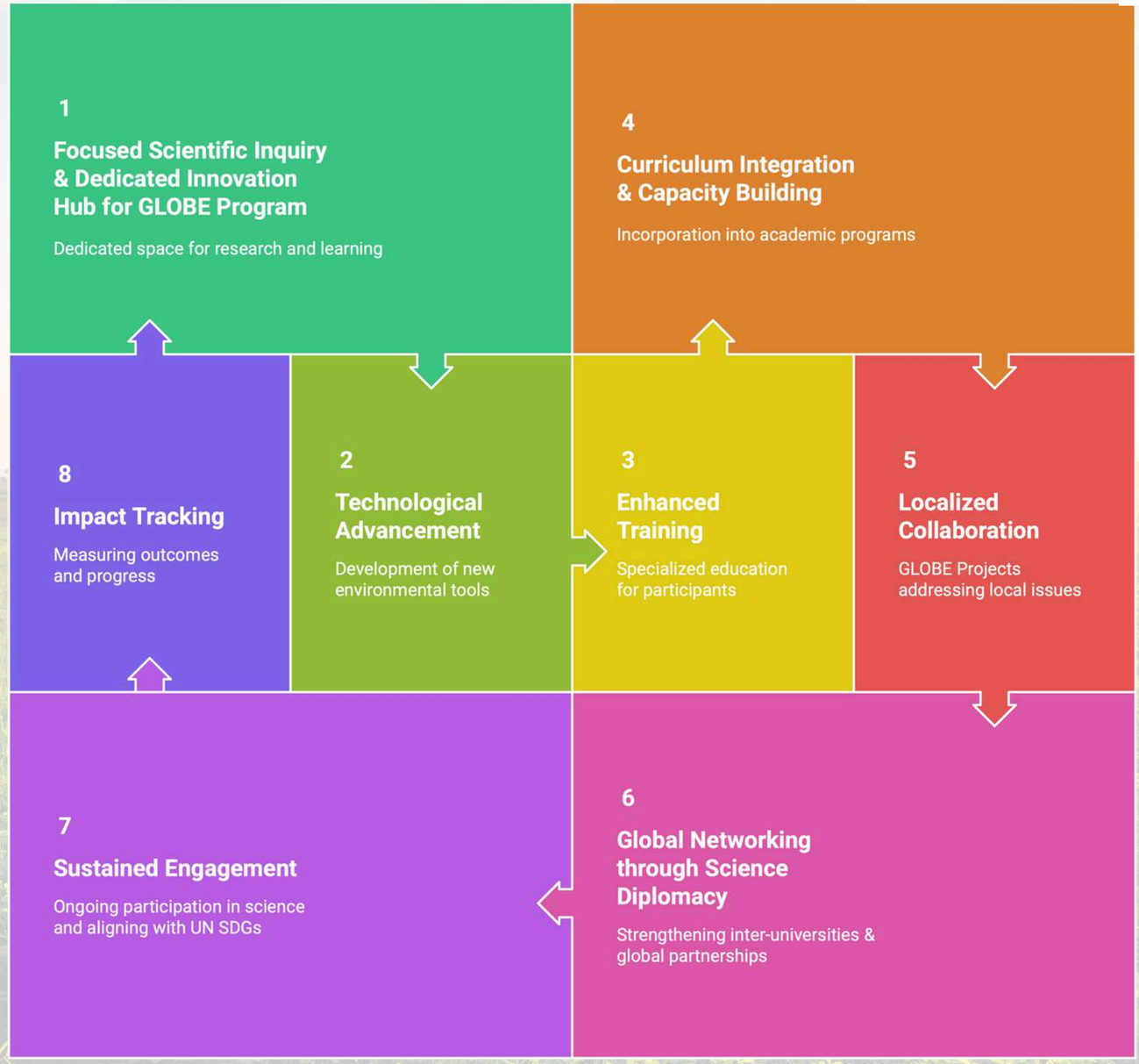
Presenting in research at GLOBE Trees Campaigns

The GLOBE Lab Research Cycle



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We warmly invite you to collaborate with us on joint research endeavors.

For more details, reach out to: patil.yscoe@snjb.org

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Join Us

Towards a Sustainable Community

Thank you and,

See You!

For more information, contact at:

patil.yscoe@snjb.org