

Session Report September 30, 2024

1 Identification

1.1 Session ID **2157411**

1.2 Session Title **“Fostering Global Engagement: Leveraging the GLOBE International STEM Network”**

1.3 Session Date and Time **17 September 11 AM US Eastern time**

1.4 Convenor name **Larisa Schelkin**

2 Speakers and Panelists

Please list all speakers and panellists, including their names, titles, and organisational affiliations.

2.1 Speaker 1

2.1.1 Name: **Rusty Low (Moderator)**

2.1.2 Organisation name: GLOBE Program GIO

2.1.3 Type of organisation: Non-profit

2.1.4 Title of the presentation: Virtual

2.1.5 Summary of the presentation (max 200 words):

Our session encapsulates an interactive discussion on the collaborative efforts between the GLOBE International STEM Network (GISN), educators, and students to advance Earth science and contribute to the United Nations Sustainable Development Goals (UN SDGs). This session illuminates the transformative power of global engagement in addressing pressing environmental challenges through open science practices. By leveraging the diverse expertise and resources within the GISN, participants explore innovative approaches to scientific research, data collection, and analysis, while aligning with the objectives outlined in the UN SDGs. Through case studies and shared experiences, attendees gain valuable insights into the tangible impact of cross-disciplinary collaboration in driving progress towards sustainability goals. The session serves as a platform to showcase best practices, foster networking opportunities, and inspire educators and students to actively participate in shaping a more sustainable future for our planet. Join us as we embark on a journey of collaboration, innovation, and global engagement to tackle the complex challenges facing our world today.

2.2 Speaker 2

2.2.1 Name: **Magdalena Waleska Aldana Segura**

2.2.2 Organisation name: GLOBE GISN

2.2.3 Type of organisation: Non-profit

2.2.4 Title of the presentation: Virtual

2.2.5 Summary of the presentation (max 200 words):

Dr. Magdalena Waleska Aldana Segura's presentation outlines the achievements of a STEAM program in Guatemala, coordinated by Universidad de San Carlos and Universidad Galileo. The program aims to inspire students to pursue STEAM careers and supports teacher certification in the GLOBE Program, with backing from the LAC GLOBE regional office.

Key accomplishments include:

- Participation: 1.7 million online seminar attendees, 18,500 K-12 students, and 15,000 teachers involved, with three Guatemalan teams in the International Virtual Science Symposium (IVSS).
- Projects: Students linked Aedes mosquito larvae to Dengue outbreaks, creating a mosquito repellent needing updates every six months. An Arduino-based automatic watering system project achieved 60% water savings by identifying soil quality differences. Additionally, over 30,000 eclipse glasses were distributed, supported by international alliances and the US Embassy, motivating further study in cloud formation.
- Future Goals: Ongoing analysis of the mosquito repellent, continued research on cosmic rays and cloud formation, and increasing regional interest in the GLOBE program.

The presentation highlights the program's success in engaging students in STEAM and advancing scientific research and education in Guatemala.

2.3 Speaker 3

2.3.1 Name: **Marco Contin**

2.3.2 Organisation name: Udine University

2.3.3 Type of organisation: Academia

2.3.4 Title of the presentation: Virtual

2.3.5 Summary of the presentation (max 200 words):

Dr. Marco Contin's presentation focuses on the SLE-GO (Science Learning Expedition - Gorizia, Italy, and Nova Gorica, Slovenia) project, which is centered on environmental education and cross-border collaboration between Italy and Slovenia.

The project engages students in hands-on environmental observation and analysis alongside scientists, with a focus on topics such as soil health, wildfire effects, agricultural impact, and microplastics. The project is divided into three phases:

1. **Expedition:** High school students, guided by scientists, explore and analyze the environment across five key sites in the cross-border area, including Mount Cerie, Mount San Michele, and the River Soca-Isonzo.
2. **Extension:** High school students then teach primary school pupils by setting up thematic stands and laboratories to showcase their findings.
3. **Dissemination:** A final conference where scientists and teachers present the results of the expeditions to the public through a multimedia exhibition.

The initiative aims to increase scientific literacy and public awareness of key environmental issues, while fostering student engagement in STEM education. This cross-border project promotes the dissemination of scientific knowledge to a wider audience, contributing to Sustainable Development Goals (SDGs).

Key goals for scientists involved in the project include expanding global data collection, increasing the visibility of their research, and inspiring new research ideas through engagement with the broader community. The program emphasizes maintaining strong relationships with teachers, organizing efficiently, and keeping a rigorous scientific approach, all while leveraging the GLOBE International STEM Network to foster global engagement.

2.4 Speaker 4

2.4.1 Name: **Sanduni Kanishka**

2.4.2 Organisation name: GLOBE GISN

2.4.3 Type of organisation: Non-profit

2.4.4 Title of the presentation: Virtual

2.4.5 Summary of the presentation (max 200 words):

Dr. Sanduni K. Madarasinghe's presentation focuses on a case study investigating microplastic (MP) pollution in the Garanduwa Lagoon, located in the touristic area of Mirissa, Sri Lanka. The study aims to assess the extent and spatial distribution of MPs in the lagoon's water, sediments, and adjacent land-use/cover (LULC) types. The project was supervised by researchers from the University of Ruhuna and the University of Vavuniya, with student participation.

Data collection involved identifying and quantifying microplastics based on shape and color, followed by mapping their distribution. The study revealed a significant presence of microplastics in different areas, with the highest concentrations found in adjacent LULC types, particularly near effluents from hotels, surrounding houses, and fisheries.

Key findings highlight tourism, household waste, and fishing activities as major contributors to microplastic pollution in the lagoon. The research calls for future studies to assess the trophic transfer of microplastics, especially in fish, to determine potential impacts on human health.

The project aligns with sustainable development goals (SDGs) aimed at protecting marine ecosystems and reducing plastic waste, while also contributing to global discussions on environmental sustainability and pollution management.

2.5 Speaker 5

- 2.5.1 Name: **Fasakin Olawunmi**
- 2.5.2 Organisation name: GLOBE GISN
- 2.5.3 Type of organisation: Non-profit
- 2.5.4 Title of the presentation: Virtual
- 2.5.5 Summary of the presentation (max 200 words):

The GLOBE Program presentation by Dr. Olawunmi Fasakin highlights Nigeria's active participation in global environmental science education, particularly through the GLOBE International STEM Network (GISN). The presentation discusses the expansion of GISN to include Early Career STEM Professionals, fostering global collaborations and mentorship opportunities. Nigeria plays a significant role, with numerous projects aimed at promoting environmental awareness, organizing educational workshops, and engaging students in international science contests.

Key initiatives include research on mosquito larval population dynamics in Akure, Nigeria, which examined the influence of physicochemical factors like air temperature, water pH, and water temperature on mosquito species. The study found Culex mosquitoes to be the most dominant, highlighting the role of water quality in mosquito proliferation.

Additionally, students from St. Peter's Unity Secondary School investigated the urban heat island effect using GLOBE protocols to measure air and surface temperatures, humidity, and wind speed. The findings emphasize the need to consider local climate dynamics and urban heat effects in broader climate change discussions.

Overall, the presentation underscores the importance of empowering the next generation of STEM professionals and fostering global collaboration to tackle environmental challenges.

2.6 Speaker 6

- 2.6.1 Name: **Hilal Al-Shukairi**
- 2.6.2 Organisation name: GLOBE GISN OMAN
- 2.6.3 Type of organisation: Non-profit
- 2.6.4 Title of the presentation: Virtual
- 2.6.5 Summary of the presentation (max 200 words):

The presentation by Hilal Al-Shukairi highlights the growth and success of the GLOBE Program in Oman since its inception in 2009. Initially implemented in six schools, the program now involves 57 schools across the country, reflecting Oman's commitment to fostering environmental education and supporting its Vision 2040 goals. The GLOBE Program provides students and teachers with the tools and knowledge to engage in environmental research, utilizing the country's rich biodiversity and diverse landscapes.

The presentation emphasizes key activities, such as training workshops, field trips, and science competitions, both locally and internationally. Notably, Omani students have achieved

significant success in global competitions, with two students winning first place for their research on soil's impact on rose growth.

Success stories from the program showcase the transformative impact of GLOBE, including Maryam, an environmental science student turned activist, and Mohammed, a Grade 7 student who inspired his family to engage in environmental research. Oman's participation in international and regional GLOBE meetings, including the 2023 GLOBE Program Annual Meeting in Colorado, highlights the nation's continued achievements and contributions to global environmental education.

2.7 Speaker 7

2.7.1 Name: **Michael Notaro**

2.7.2 Organisation name: University of Wisconsin-Madison

2.7.3 Type of organisation: Academia

2.7.4 Title of the presentation: Virtual

2.7.5 Summary of the presentation (max 200 words):

Dr. Michael Notaro's presentation focuses on the integration of neurodivergent youth, particularly autistic students, into STEM fields through nature-based, experiential learning programs. Autistic students show a higher propensity to pursue STEM majors, yet face challenges in transitioning to college, including social, sensory, and organizational hurdles. Dr. Notaro emphasizes the need for specialized teaching strategies and early exposure to STEM careers to ease this transition.

Dr. Notaro's camps, such as "The Sky's The Limit" STEM Camp in Beloit, Wisconsin, offer autistic youth hands-on, outdoor learning experiences. These camps, funded by organizations like the National Science Foundation and the University of Wisconsin, provide a safe and supportive environment, helping students engage with science while accommodating their unique learning needs.

The camps draw on the GLOBE's Program protocols to teach climate science, with activities ranging from urban heat island mapping to water quality testing and macroinvertebrate identification. The goal is to foster inquisitiveness, encourage pursuit of STEM careers, and embrace neurodiversity as a strength in the scientific community. Dr. Notaro's work underscores the importance of diverse perspectives in science and offers a model for inclusive education that benefits neurodivergent students.

3 Content

3.1 Session Abstract (max. 500 words)

Objectives and Scope

- This session aims to highlight the pivotal role of the GLOBE International STEM Network (GISN) in advancing Earth science research and contributing to the United Nations Sustainable Development Goals (UN SDGs). The session focuses on collaborative efforts involving educators, policymakers, environmental scientists, and international development professionals. It explores how GISN members leverage global partnerships and innovative methodologies, including Artificial Intelligence (AI), to empower students and educators in addressing pressing environmental challenges.

Key Successes and Methodology

- The integration of AI technologies into GLOBE educational programs stands as a key success, enhancing data collection, analysis, and interpretation for students and educators. The methodologies employed combine open science practices, cross-disciplinary collaboration, and capacity-building initiatives. Through case studies and shared experiences, participants will gain insights into the tangible impact of these approaches in progressing towards sustainability goals. The session will showcase how these methodologies have been instrumental in driving educational and research advancements, demonstrating their effectiveness in real-world applications.

Future Strategies and Innovations

- Looking ahead, GISN plans to expand its reach and impact through strategic partnerships, capacity-building workshops, and the development of innovative educational resources. The exploration of emerging technologies, such as remote sensing and machine learning, is pivotal in enhancing Earth science research capabilities. These technologies foster global collaboration by providing new tools and techniques for understanding and addressing environmental issues. The session will also discuss potential innovations that could further empower GLOBE participants and expand the network's influence in the realm of Earth science and sustainability.

Global Partnerships and Collaborative Efforts

- Global partnerships with educational institutions, government agencies, NGOs, and international organizations are essential to advancing GISN's mission. Collaborative efforts include joint research projects, knowledge sharing, and resource mobilization aimed at tackling complex environmental issues on a global scale. These partnerships enhance the network's capacity to foster global engagement and support the collective pursuit of sustainable development.

Advancing Global Sustainability

- The session emphasizes the critical role of education, capacity-building, and collaborative research in advancing global sustainability. By providing students and educators with the necessary knowledge, skills, and resources, GISN contributes significantly to achieving the UN SDGs. The program's initiatives help build a more informed and engaged global citizenry, capable of addressing environmental challenges and promoting sustainable practices.

Long-term Vision and Adaptability

- GISN's long-term vision is to cultivate a global community of engaged learners, empowered educators, and innovative researchers dedicated to Earth science and sustainable development. Adaptability is crucial in this endeavor, allowing the network to respond effectively to evolving challenges and opportunities in education and environmental science. GISN's commitment to remaining responsive ensures its continued relevance and impact.

Target Audience

- This session is designed for educators, policymakers, environmental scientists, international development professionals, and others interested in the intersection of education, sustainability, and global collaboration. It aims to foster dialogue, facilitate knowledge

exchange, and create partnership opportunities, ultimately inspiring action and contributing to a more sustainable and equitable world.

3.2 Project Objectives

List the key objectives your session or project aimed to achieve.

3.2.1 Objective 1 (max 50 words)

Promote International Collaboration: Highlight the role of the GLOBE Program in fostering international collaboration among students, educators, and scientists. Showcase how this global STEM network supports collective efforts in Earth science research and contributes to the achievement of the UN SDGs through cross-border cooperation.

3.2.2 Objective 2 (max 50 words)

Enhance STEM Education and Engagement: Demonstrate how the GLOBE Program empowers students and educators worldwide by providing hands-on scientific experiences and data collection opportunities. Emphasize the program's impact on enhancing STEM education, inspiring the next generation of scientists, and promoting inclusive, equitable learning experiences.

3.2.3 Objective 3 (max 50 words)

Address Global Environmental Challenges: Discuss the program's contributions to understand and addressing critical global environmental issues such as climate change, biodiversity loss, and pollution. Highlight how GLOBE's citizen science data and research initiatives align with the UN SDGs, providing valuable insights for sustainable development and policymaking.

3.3 Key Themes

Main themes and topics that were covered during the session. The same ones you selected when you submitted your original session proposal. Select from the following. Maximum three

- **Environment and Climate**
- **Space**
- **Education & Youth**

4 Planned Impacts of the science and innovation presented in you session

4.1 Contribution to the SDGs

The SDGs provide a comprehensive framework for addressing the world's most pressing challenges and promoting sustainable development globally. Select the Goal/s that your project contributes to (max 3 SDGs)

#4. **Quality Education:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

#13. **Climate Action:** Take urgent action to combat climate change and its impacts.

#17. **Partnerships for the Goals:** Strengthen the means of implementation and revitalize the global partnership for sustainable development.

5 Contribution to the UN Summit of the Future

5.1 Main challenges (max 200 words)

Main challenges and difficulties experienced in implementing the science to contribute to the Sustainable Development Goals and provide recommendations to address the same whole.

This GLOBE session showcases how global educational networks can advance the Sustainable Development Goals (SDGs). It emphasizes the use of innovative technologies, like AI and remote sensing, to enhance environmental education and scientific literacy. The session contributes by demonstrating practical approaches to global collaboration and fostering a committed community towards sustainable practices.

Main Challenges and Recommendations

Challenges:

1. **Resource Accessibility:** Disparities in access to technology and educational resources limit participation, especially in under-resourced regions.
2. **Technological Integration:** Integrating emerging technologies into curricula requires substantial training and infrastructure.
3. **Global Collaboration:** Diverse educational standards and languages complicate data standardization and collaboration.
4. **Sustainable Engagement:** Maintaining long-term engagement and funding is challenging as priorities shift.

Recommendations:

1. **Enhance Access:** Improve digital infrastructure and provide necessary resources in under-resourced areas.
2. **Educator Training:** Offer comprehensive training in emerging technologies and their classroom integration.
3. **Standardization and Collaboration:** Develop global data standards and foster multilingual, culturally relevant materials.
4. **Sustainable Funding:** Secure funding through public-private partnerships and international grants.

These steps aim to ensure that initiatives like GLOBE can effectively contribute to achieving the SDGs through global education and collaboration.

5.2 Additional goals (max 200 words)

Additional goals, beyond the Goals, which are considered priorities

Beyond its primary focus on advancing Earth science education and contributing to the Sustainable Development Goals (SDGs), the GLOBE Program aims to achieve several additional goals:

1. **Cultivating Global Scientific Literacy:** Expand efforts to enhance public understanding of science, particularly in areas related to environmental issues. This includes developing outreach programs that target not only students and educators but also the general public, fostering a culture of scientific inquiry and critical thinking.
2. **Promoting Environmental Stewardship:** Encourage participants to actively engage in local environmental conservation efforts. By integrating citizen science projects with local sustainability initiatives, GLOBE aims to empower communities to take concrete actions towards preserving their natural environments.
3. **Supporting Lifelong Learning:** Extend educational opportunities beyond traditional school settings by offering resources and programs for lifelong learners, including adults and non-traditional students. This goal focuses on making STEM education accessible and relevant for all ages.
4. **Enhancing Technological Innovation:** Foster innovation in data collection and analysis methods. This includes experimenting with new technologies and tools that can provide more accurate and comprehensive environmental data, thus enhancing the quality of scientific research conducted through the program.

These additional goals complement the core objectives of GLOBE, aiming to broaden its impact and reach.

5.3 Integration: economic, social and environmental (max 500 words)

The steps being taken to integrate the three dimensions of sustainable development (economic, social, and environmental) and share best practices where available and how activities are being designed and implemented to reflect such integration.

GLOBE Program Contributions to the UN Summit of the Future

Integration of Economic, Social, and Environmental Dimensions

The GLOBE Program integrates economic, social, and environmental dimensions of sustainable development, reflecting a holistic approach to addressing global challenges.

Economic Integration

The GLOBE Program contributes to economic development by equipping students with STEM skills relevant to the modern workforce. This initiative fosters a scientifically literate population, supporting various economic sectors, including environmental science, technology, and data analysis. By promoting sustainable practices, GLOBE also aids local economic development. For instance, students' data collection efforts can inform and

optimize agricultural practices, improving crop yields and promoting sustainable land use, thus providing direct economic benefits.

Social Integration

The program emphasizes social inclusion and equity, providing educational resources and training to diverse populations globally. GLOBE ensures access to high-quality STEM education for students and educators from all socio-economic backgrounds. It actively promotes gender equality by encouraging girls and women to participate in scientific activities, addressing gender disparities in STEM fields. Additionally, the program fosters global citizenship by connecting participants across different cultures and regions, promoting cross-cultural understanding and cooperation.

Environmental Integration

Environmental education and stewardship are core components of the GLOBE Program. Students engage in hands-on data collection and research on environmental parameters such as climate, water quality, and biodiversity. This experience enhances their understanding of environmental issues and contributes valuable data to global scientific databases. GLOBE's focus on sustainability encourages participants to proactively address environmental challenges in their communities, fostering a culture of stewardship and conservation.

Best Practices and Implementation

The program's integration of these dimensions is evident in several best practices:

1. **Global Partnerships:** The program collaborates with governments, NGOs, educational institutions, and the private sector, facilitating knowledge exchange and best practices. These partnerships ensure GLOBE's relevance and effectiveness in addressing global challenges.
2. **Capacity Building:** GLOBE invests in training educators and students, enhancing their ability to participate in scientific research and apply their knowledge to real-world problems. This includes workshops, online training modules, and accessible resources.
3. **Community Engagement:** The program supports community-based projects addressing local environmental issues, ensuring activities are grounded in real-world needs and solutions are sustainable and relevant.
4. **Use of Technology:** Incorporating advanced technologies such as AI and remote sensing, GLOBE enhances data collection and analysis. This integration improves research quality and makes scientific inquiry accessible to a broader audience.

Conclusion

The GLOBE Program's contributions to the UN Summit of the Future are characterized by its comprehensive integration of economic, social, and environmental dimensions of sustainable development. By advancing STEM education, fostering global partnerships, and engaging communities, GLOBE builds a foundation for a more sustainable and equitable future. The program's activities exemplify how education and collaboration can drive progress toward the Sustainable Development Goals.

5.4 Impact on the 2030 Agenda (max 1000 words)

A success metric for your project is primarily in how it delivers for all persons in our societies. Describe how other principles of the 2030 Agenda, for example, respect for all human rights, gender equality, the principle of Leaving No One Behind, non-discrimination, etc, have been mainstreamed in your science project.

More info on: 2030 Agenda: <https://sdgs.un.org/2030agenda>

Please select also the transition relevant to your science project:

(1) food systems; (2) energy access and affordability; (3) digital connectivity; (4) education; (5) jobs and social protection; and (6) climate change, biodiversity loss and pollution

More info on Six transitions: <https://unsdg.un.org/sites/default/files/2023-09/Six%20Transitions%20English.pdf>

GLOBE Program Impact on the 2030 Agenda

The GLOBE Program has made significant strides in advancing the principles and goals of the 2030 Agenda for Sustainable Development. By focusing on Education for Sustainable Development (ESD), the program integrates key elements of human rights, gender equality, inclusivity, and non-discrimination, aligning closely with the Sustainable Development Goals (SDGs).

Promotion of Inclusive and Equitable Quality Education (SDG 4)

Aligned with SDG Goal #4, GLOBE is dedicated to providing inclusive and equitable quality education and promoting lifelong learning opportunities for all. The program offers a platform for students, educators, and citizen scientists worldwide to engage in hands-on environmental research, deepening their understanding of Earth's systems. By making educational resources and training materials available in multiple languages and formats, GLOBE ensures accessibility for diverse populations, including those in underserved and remote regions.

Respect for Human Rights and Gender Equality

The GLOBE Program upholds the principles of human rights and gender equality. It actively promotes gender equality by encouraging the participation of girls and women in STEM activities, thereby addressing gender disparities in science education and careers. The program's partnerships with organizations that empower women and girls in science further underscore its commitment to inclusivity and equality.

GLOBE's inclusive design ensures participation from diverse socio-economic backgrounds, cultures, and abilities, aligning with the core principle of the 2030 Agenda: Leaving No One Behind. By engaging marginalized and vulnerable groups in scientific activities, the program contributes to building a more equitable and just society.

Environmental Sustainability and Community Engagement

At its core, the GLOBE Program focuses on environmental education and stewardship. It empowers individuals to observe and understand their local environments through data collection and analysis of key environmental indicators such as air quality, water quality, and biodiversity. This engagement enhances participants' awareness of global environmental challenges and encourages proactive community actions.

The program emphasizes local data collection and community-based projects, integrating environmental sustainability into local decision-making processes. By providing real-time, locally relevant data, GLOBE aids communities in addressing environmental issues and developing sustainable solutions. This approach aligns with the principles of Agenda 21 and the outcomes of the Rio+20 Conference.

Interdisciplinary and Collaborative Approach

The program collaborates with educational institutions, governments, NGOs, and international organizations, facilitating the exchange of knowledge and best practices. GLOBE's involvement in initiatives like the Higher Education Sustainability Initiative (HESI) strengthens its role in promoting sustainable development education globally.

Capacity Building and Technological Innovation

GLOBE is committed to capacity building, training educators and students in scientific research methods and emerging technologies. This includes workshops, online training modules, and access to advanced tools such as remote sensing and data analysis software. These efforts not only enhance educational experiences but also prepare participants for careers in science and technology sectors.

The program's use of technology, including AI in data analysis, exemplifies its commitment to innovation. These technologies improve the quality and accuracy of environmental data, making scientific research more accessible and engaging. This focus on innovation ensures that GLOBE remains at the forefront of environmental education and research, contributing to the broader goals of the 2030 Agenda.

Holistic Educational Approach: Earth as a System

GLOBE's holistic educational approach encourages students to view Earth as an interconnected system. This "Earth as a System" investigation area is crucial for addressing complex environmental challenges, underscoring the need for integrated approaches to sustainable development.

By covering various Earth spheres—Atmosphere, Biosphere, Hydrosphere, and Soil (Pedosphere)—and aligning with multiple SDGs, the program offers a comprehensive educational experience. For example, the focus on the water cycle (SDG Goal #6) and ocean science (SDG Goal #14) equips students to become active hydrologists and marine scientists, promoting water conservation and sustainable use of marine resources. The study of terrestrial ecosystems (SDG Goal #15) enhances understanding of biodiversity and soil health, crucial for sustainable land use and conservation.

Conclusion

The GLOBE Program's impact on the 2030 Agenda is multifaceted, promoting sustainable development through education. By embedding the principles of human rights, gender equality, and inclusivity into its activities and focusing on the interconnectedness of various dimensions of sustainability, GLOBE offers a model for how education can drive progress toward the SDGs. The program's emphasis on community engagement, interdisciplinary learning, and technological innovation makes it a vital tool for fostering global engagement and advancing the goals of the 2030 Agenda. Through its diverse educational and research activities, GLOBE not only enhances scientific literacy but also instills a sense of responsibility and stewardship among participants, preparing them to be informed and proactive global citizens.

6 Forward-looking Statement

6.1 Financial aspects

Why giving \$ 1 million to your project will turbo boost the achievement of the SDGs.

Three bullets (50 words/bullet).

1. **Enhanced Data Collection and Sharing:** The GLOBE program's expansion will improve global environmental data collection, enabling better monitoring and reporting on critical SDG indicators, such as climate action (SDG 13) and life on land (SDG 15). This funding will facilitate real-time, data-driven decision-making for sustainable development.
2. **Global Educational Outreach:** With increased funding, GLOBE can enhance its educational initiatives, promoting quality education (SDG 4) and fostering a global citizenry informed about environmental challenges. This will empower young people worldwide with the knowledge and skills needed to address sustainable development issues in their communities.
3. **Fostering International Collaboration:** A \$1 million investment will strengthen GLOBE's partnerships with schools, governments, and organizations globally, encouraging international cooperation for sustainable development. This aligns with SDG 17, which emphasizes the importance of partnerships for achieving the goals, promoting a unified effort towards a more sustainable future.

6.2 To further advance your science project, you will need:

Please select an option and develop it further (50 words). Multiple selection is possible.

- **Access to Funding**
- **Skilled Personnel**
- **Open Access to Data**
- **Access to Resources** (laboratory facilities, research tools, and technology).
- **Establish Partnerships and Collaborations**
- **Dissemination and Communication activities**
- **Enhance the Regulatory Environment** that supports research initiatives.
- **Access to Market**
- **Advanced Technology**

To further advance GLOBE, we will need:

Establish Partnerships and Collaborations: Developing strategic partnerships with educational institutions, NGOs, government agencies, and private sector entities will be crucial. These collaborations can enhance resource sharing, provide additional expertise, and expand the program's reach, ensuring a more comprehensive and impactful implementation of environmental education and data collection initiatives.

Access to Funding: Securing consistent funding is essential for scaling up the program's activities, including expanding educational resources, supporting research projects, and developing new technologies. Increased financial support will enable GLOBE to reach more diverse populations and enhance the quality of its educational offerings.

Access to Resources: Access to state-of-the-art laboratory facilities, research tools, and advanced technology is vital for accurate data collection and analysis. Providing participants with these resources will enhance the scientific rigor of their research and enable more sophisticated environmental studies.

Dissemination and Communication Activities: Effective communication strategies are needed to share the program's findings and impact with a broader audience. This includes publishing research results, conducting public outreach, and using digital platforms to engage with global communities, thereby raising awareness and encouraging participation in GLOBE's initiatives.

7 Conclusions (max. 300 words)

Provide a concluding summary on how science contributes to achieving the SDGs, incorporating policy recommendations.

Highlight any new or emerging issues identified during the session, suggest possible next steps or areas for further research and discussion, and outline the support needed to advance science and innovation in your field.

Science plays a pivotal role in achieving the Sustainable Development Goals (SDGs) by providing the evidence base needed for informed decision-making and policy formulation. The GLOBE Program exemplifies this contribution through its comprehensive approach to environmental education and citizen science. By engaging students, educators, and communities in hands-on scientific research, GLOBE enhances our understanding of critical environmental issues, such as climate change, water quality, and biodiversity loss. This, in turn, supports the development of effective policies and actions that align with the SDGs.

Policy Recommendations:

1. **Strengthen STEM Education:** Governments and educational institutions should prioritize STEM education, incorporating programs like GLOBE to build scientific literacy and critical thinking skills from a young age.
2. **Promote Open Data and Research Collaboration:** Policymakers should support initiatives that promote open access to scientific data and foster international collaborations, ensuring that data and findings are accessible to all stakeholders.
3. **Invest in Capacity Building:** There is a need for increased investment in training educators and equipping schools with the necessary resources and technology to support environmental science education.

Emerging Issues and Future Directions: During our session, the increasing importance of integrating advanced technologies, such as AI and remote sensing, into educational programs was highlighted. Additionally, the need for greater emphasis on interdisciplinary research that considers socio-economic and cultural dimensions of environmental issues was identified.

Next Steps and Further Research: Future research should focus on developing scalable models for integrating innovative technologies into science education. Additionally, exploring the socio-economic impacts of environmental changes and how they intersect with gender and equity issues will be crucial.

Support Needed: To advance science and innovation, continued support is needed in several key areas:

- **Funding:** Sustainable funding mechanisms are essential for scaling up initiatives like GLOBE.
- **Partnerships:** Building strong partnerships across sectors will enhance resource sharing and expertise.
- **Resource Access:** Providing access to cutting-edge research tools and facilities is crucial for advancing scientific inquiry.

In conclusion, the integration of science into educational and policy frameworks is indispensable for achieving the SDGs. The GLOBE Program remains committed to fostering a global community of informed citizens capable of addressing the environmental challenges of our time.