Digital Governance and a Socially Just Transition toward Sustainable Development:
A Proposal for an
International SDG Science, Technology, and Innovation (STI) Policy Fellowship Program

For the

United Nations Department of Economic and Social Affairs (UNDESA)
Expert Group Meeting on Socially Just Transition toward Sustainable Development:
The Role of Digital Technologies on Social Development and The Well-Being of All
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By

Deborah D. Stine, PhD
President, Science, Technology, and Innovation Policy Analysis and Education LLC
Founder and Director, Science and Technology Policy Academy
Deborah@Deborah-stine.com
www.deborah-stine.com; www.scitechpolicyacademy.com

When I was asked to speak on the topic of "Digital governance in the fields of privacy and data protection, online safety and security, and misinformation and disinformation, algorithmic discrimination or bias, etc.," my mind immediately went to technology. As I'm an environmental engineer, this is probably not surprising. I first put together a presentation focused on innovative technologies and how the really great models out there could be expanded to other areas of the world.

I was then reminded, however, by the conference organizers, that this event is for the department of the UN that focuses on people. That comment spurred a breakthrough in my thinking – what we really need are not more technologies, even innovative ones, as much as the people to help implement those technologies working in partnership with local communities and empowering those communities to manage the technologies.

But how can we do so in a way that is effective in reaching the Sustainable Development Goals (SDGs), economically efficient, equitable to all those involved, and easy in terms of community and political leader acceptance?

What is the Underlying Problem?: Insufficient Human Capacity to Address the Digital Governance and SDGs

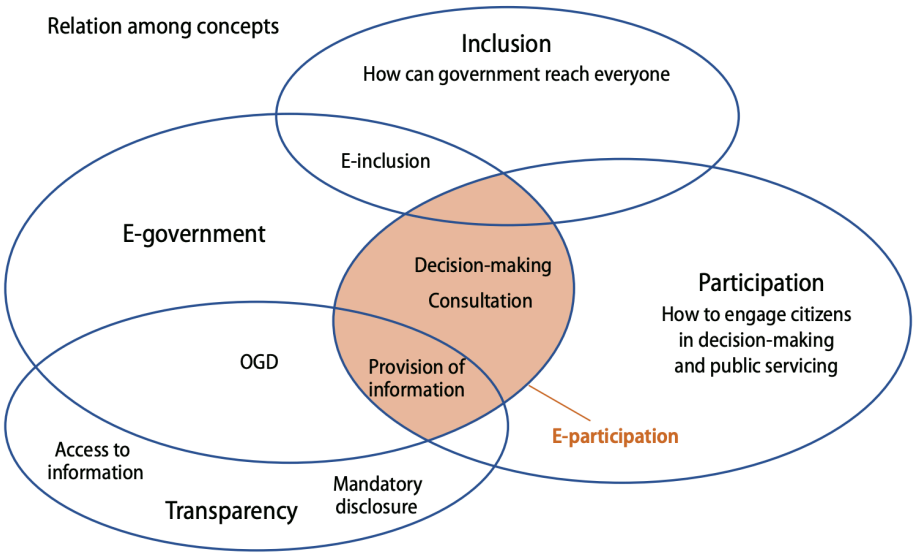
The issue is not technology, but increasing our human capacity in digital governance. That is the problem that we need to solve. When I teach students about public policy analysis, I always emphasize the need to identify the underlying problem. In this case, it is "human capacity in digital governance." I then came across the following quote from a UN report, "The Age of

Digital Interdependence," which is Report of the UN Secretary-General's High-level Panel on Digital Cooperation, that emphasizes this point.

> *"The UN can play a key role in enhancing digital cooperation by **developing greater** organisational and **human capacity** on **digital governance** issues and improving its ability to respond to member states' need for policy advice and capacity development."* (emphasis added)

Human capacity, in this case, involves not just those in government or in science and technology, but also local citizens. The January 2020 United Nations Department of Economic and Social Affairs (UNDESA) report, "E-participation: a quick overview of recent qualitative trends," by David Le Blanc illustrates this interaction. As shown in Figure 1, e-participation in-e-government involves provision of information, consultation, and decision-making with the goal of enhancing inclusion, participation, and transparency.

Figure 1
Relations among e-participation and selected governance concepts



Source: Author's elaboration.

Note: The figure represents e-participation as the intersection of participation and e-government. The figure refers to the three classic levels of e-participation used in the e-government Survey: provision of information, consultation, and decision-making. Transparency intersects with e-participation around the provision of information, including through open government data (OGD). Inclusion intersects with e-participation as well, especially in relation to consultation and decision-making.

Source: E-participation: a quick overview of recent qualitative trends

What are the Challenges in Addressing the Human Capacity in Digital Governance and the SDGs?

As illustrated in Figure 2, there are a number of challenges related to e-government, e-governance, and e-participation. As noted by LeBlanc in the E-participation paper, sometimes governments are reluctant to share agenda-setting and decision-making power or to take the time or use the necessary human and economic resources to understand citizen's motivations and concerns.

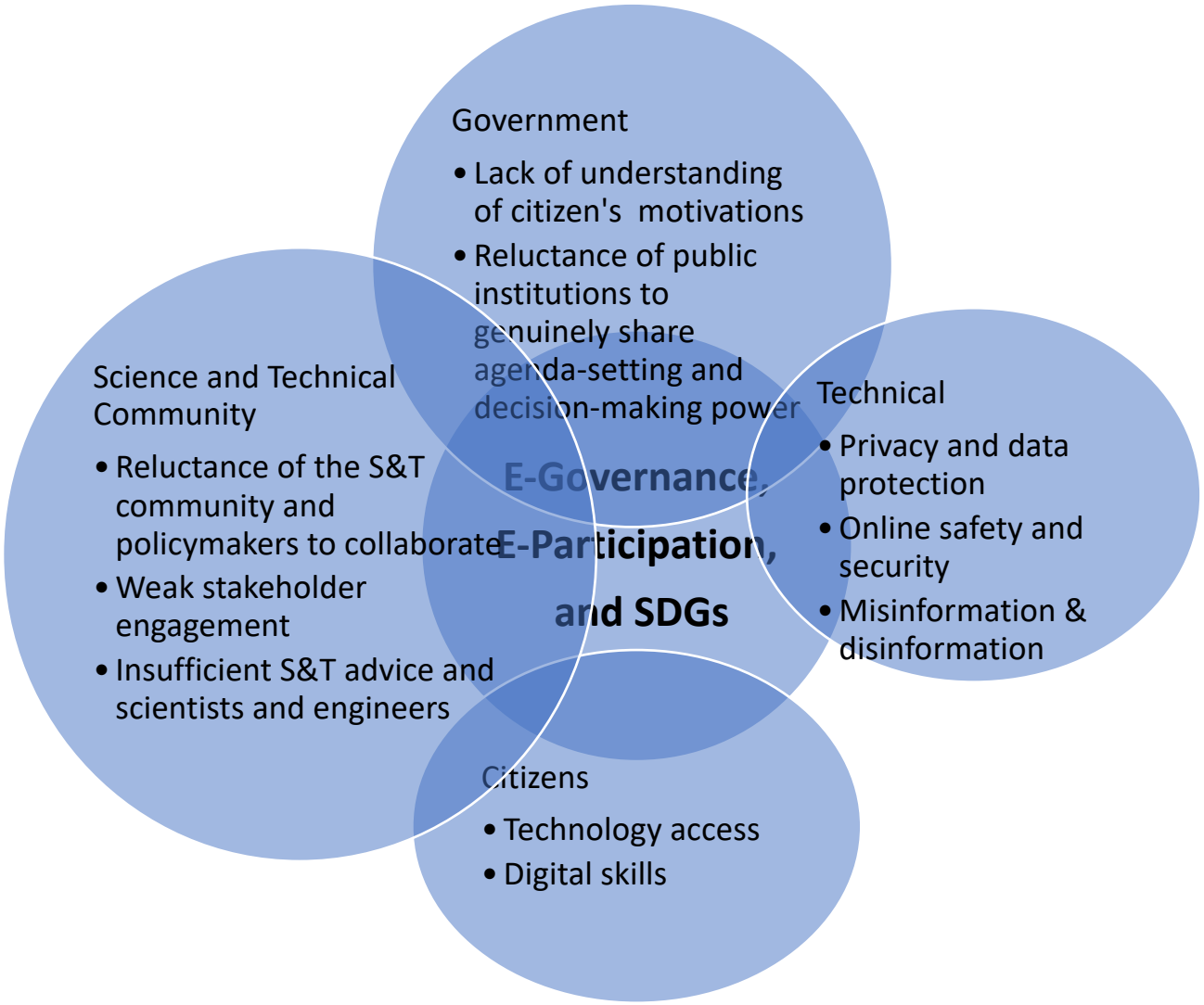


Figure 2: Challenges to E-Governance, E-Participation, and the Sustainable Development Goals (SDGs)

Source: Deborah D. Stine, Science, Technology, and Innovation Policy Analysis and Education LLC based on UNDESA's E-participation: a quick overview of recent qualitative trends, IAP's Improving Scientific Input to Global Policymaking with a focus on the UN Sustainable Development Goals, and AAAS' Connecting Scientists to Policy Landscape Analysis of Mechanisms Around the World: Engaging Scientists and Engineers in Policy Around the World

In some cases, a nation's citizens lack access to technology or have the skills to use that technology. Even in the United States, 25% of our rural residents lack internet access according to the Federal Communication Commission. There are also challening technical issues that affect all organizations and individuals such as privacy and data protection, online safety and security, and misinformation and disinformation.

According to the Interacademy Partnership (IAP), whose mission is "to convene and empower the world's academies of science, engineering and medicine to work collaboratively to address issues of global, regional, and national importance," the scientific and technical community faces challenges as well when it attempts to engage and cooperate with stakeholders. According to its May 2019 report, "Improving Scientific Input to Global Policymaking with a focus on the UN Sustainable Development Goals," these challenges include:

- reticence amongst some policymakers and scientists to collaborate with each other, alongside members of both communities who are active and keen to effect closer cooperation;
- weak STI [science, technology, and innovation] stakeholder engagement in many countries, notably with respect to STI consideration in the Voluntary National Reviews;
- imperfect, unchallenged national and regional reporting through the Voluntary National Reviews and Annual Fora on Sustainable Development, respectively; and
- low engagement and participation of the science community at some UN meetings, especially at the regional level.

The IAP also identifies other challenges such as a structural disconnect (e.g., between grassroots and more formal planned government activities) and data, monitoring, and evaluation challenges (e.g., missing, inadequate, or poor-quality data). There are other challenges as well – particularly the need for scientific and technical advice capacity. As stated by Ernesto Fernandez Polcuch, Chief of Section, Science Policy and Partnerships – the need to develop scientific and technical advice capacity. As he states in a February 2017 American Association for the Advancement of Sciences (AAAS) report "Connecting Scientists to Policy Landscape Analysis of Mechanisms Around the World: Engaging Scientists and Engineers in Policy Around the World," we need to develop capacity for science advice in countries that have few scientists already.

> *"Perhaps the biggest problem is how to develop capacity for science advice in countries where there are not enough scientists to begin with. Sometimes this is where science advice is most needed. Here is where a regional approach would work: for instance, in the Caribbean islands, where there are so many issues about climate change, disasters, and biodiversity, and there is not enough scientific capacity. It's not just a national issue."*
>
> Ernesto Fernández Polcuch, Chief of Section, Science Policy and Partnerships, UNESCO

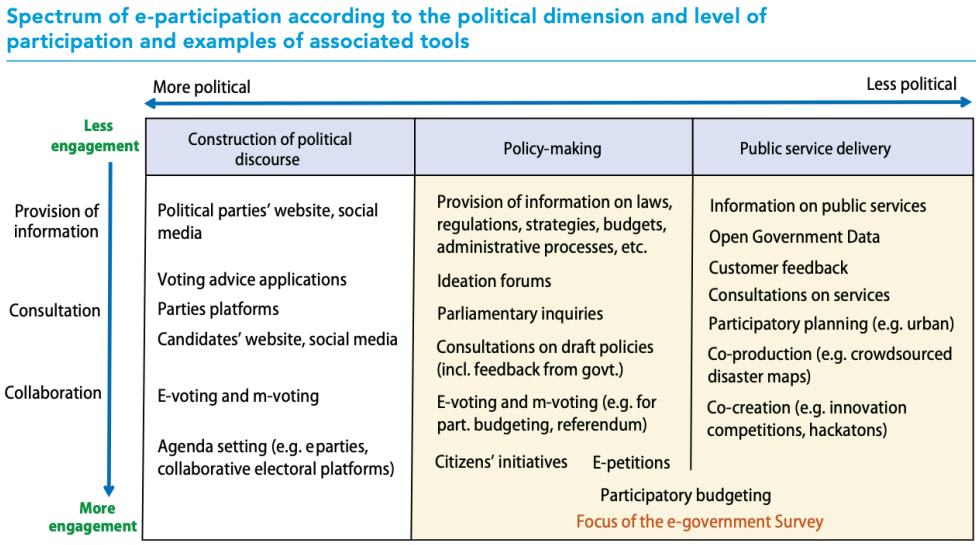
Figure 3: Insufficient Science Advice in Some Countries (Source: AAAS)

What are the Opportunities in Addressing the Human Capacity in Digital Governance and the SDGs?

There is some good news, however. And building on that good news, we have an opportunity to address the human capacity challenge in digital governance and the SDGs. At the 2017 UN STI Multistakeholder Forum, the IAP advocated for the inclusion of the following two paragraphs in the co-chair's summary:

> 61. Scientists must better understand policy and policymaking processes. **A diversity of scientists — both young and old — must be incentivized and mobilised to support evidence-based policymaking.**
>
> 69. National science, technology and innovation plans and policies should be conceived and designed in an open and inclusive manner, building on the diverse expertise and knowledge of stakeholders. Academies of science and related organized science groups should be encouraged to take an active role in national science, technology and innovation policy processes and in identifying needs and gaps. **Effective science policy interfaces are crucial for informed policymaking. The United Nations system should strengthen such interfaces, building trust between science and politics. (Emphasis added)**

In addition, as illustrated in Figure 4, the area of "public service delivery" is viewed as less political although it does require more engagement for co-production, co-creation, and participatory budgeting.



Source: Author's elaboration.
Note: The elements in the figure are not aligned, to reflect the fact that their position along the vertical scale (levels of engagement) can vary depending on the details of their design. The same can apply horizontally as well. For example, participatory budgeting has aspects of both decision-making and public service delivery.

Figure 4: Spectrum of e-participation

Source: E-participation: a quick overview of recent qualitative trends

How can the S&T Community and UNDESA work together to address the Human Capacity in Digital Governance and the SDGs?: Science, Technology, and Innovation (STI) Policy Fellowship Programs

So, the next question is how? My mind immediately went to the Science & Technology Policy Fellowship programs that have been successful in the United States and many other countries in bringing scientific and technical expertise to policy challenges. This idea also arose in the IAP report. Specifically,

> The UN and its agencies could support more fellowships for early career researchers who are keen to learn more about the policymaking process and apply their research to societal challenges.

The challenge I have with this recommendation and some of the other related statements in previous UN/IAP/AAAS reports is that the focus is on scientists – and specifically "early career researchers."

As an engineer, however, I think that view if far too limited. What we really need are not only scientists and researchers, but engineers and those who work in information technology. We need to focus not as much on research to achieve the 2030 goal within 10 years, but rather on the implementation of innovation technology. Research plays a role, of course, but more as applied research and development. We also need an emphasis on bringing in social scientists who are trained in how to engage with communities.

We also need these early-career scientists, engineers, and innovators (STIs) from multiple counties to work in partnership. As noted earlier, there is a shortage of STIs in the countries that need the most help, so if the local expertise could be expanded with more "hands on deck" and knowledge from around the world, there is a good chance we could address the most intractable challenges. Culture and trust play a major role in working with communities so it's important to have a mix of STI's from different countries.

I believe age also plays a major role. Early career STIs are more able to "listen not talk," particularly if they are trained to do so. By listening to the local population, they can co-create to meet the wide variety of SDG goals. This generation are also those who will also bear the brunt of climate change increasing their motivation for participation.

Based on the students I've had from all over the world, many are eager to make a contribution to the climate change response, but lack a way to do so. When I spoke with a student from Argentina, for example, they indicated that in order to work in STI policy, they believed they needed to remain in the United States. But they would clearly prefer to work in their home country if there were opportunities for them to do so.

How would an "International SDG Science, Technology, and Innovation (STI) Policy Fellowship Program" work?

Luckily, we have many examples of science & technology programs in many countries. Provided below is table from the AAAS report that describes the way fellowships typically work. I would only add to this that whenever the word "science" or "scientists" is mentioned, mentally add "scientists, engineers, and innovators."

Model	Target Group	Duration	Purpose
Fellowships	Graduate STEM students Early to mid-career scientists Policymakers	Typically 1 year or longer, full time	Learn ways science impacts policy Contribute unique skill sets and expertise to policymaking Establish contacts, foster relationships, build networks Increase comfort of policymakers in working with scientists Expose scientists to policy processes and culture Explore policy-related career paths Transition to civil service

Figure 5: Basic Description of S&T Policy Fellowship Programs (Source: AAAS)

The proposed fellowship would bring together three kinds of STI support: public interaction, research, and technical. These are the three elements needed to reach the SDGs.

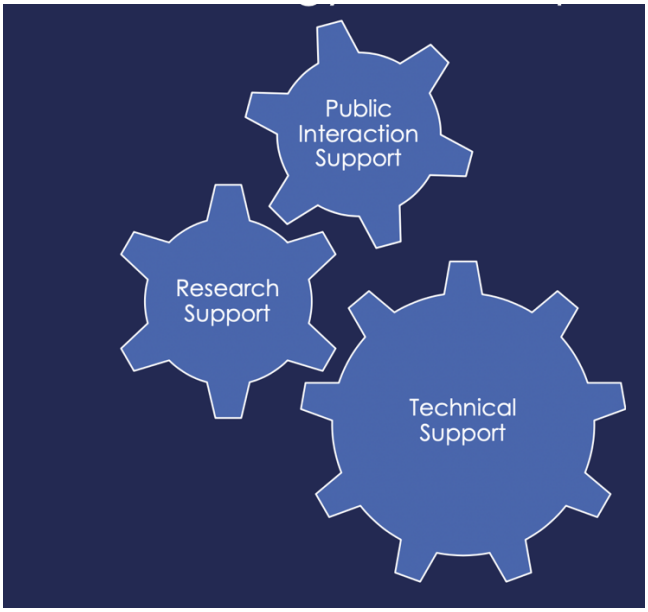


Figure 6: Key elements of an International SDG STI Policy Fellowship Program

Source: Deborah D. Stine, Science, Technology, and Innovation Policy Analysis and Education

Figure 7 provides an illustration of how the SDG STI Policy Fellowship Program would work to combat disinformation. First a team of fellows in the social sciences, information technology and the SDG topic (e.g., health, energy, environment) from both the local country and other regions would form a team. The fellows would then collect and analyze the disinformation to identify the methods and sources used by those involved in disinformation. They would also identify who is trusted within the country. Based on that analysis, the fellows would develop a campaign to fight disinformation through direct communication with the population.

Figure 7: Illustration of how the SDG STI Policy Fellowship Program Would Work to Fight Disinformation

Source: Deborah D. Stine, Science, Technology, and Innovation Policy Analysis and Education

What are the models for an International SDG STI Policy Fellowship Program?

The American Association for the Advancement of Science is probably the oldest of the S&T Policy Fellowship programs. The program began in 1973 and has over 3,400 alumni and adds about 250 fellows each year.

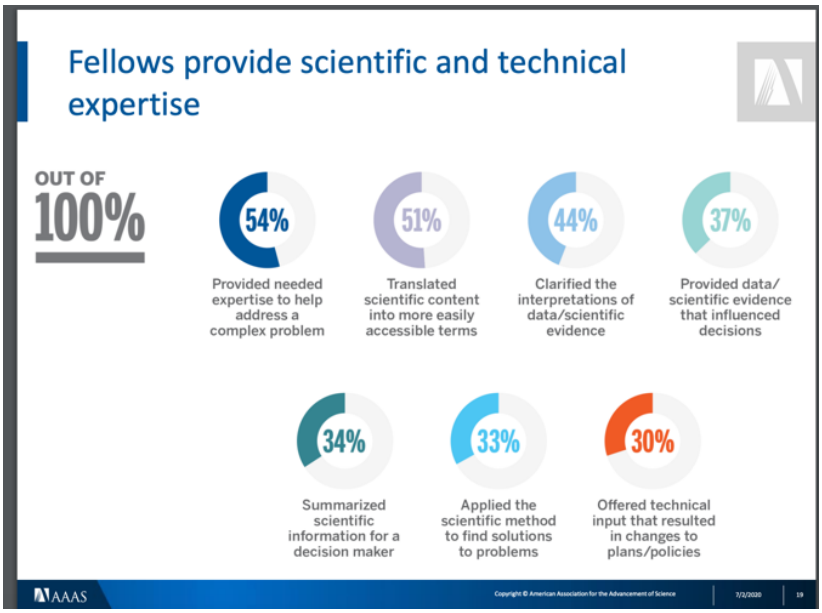


Figure 8, from a 2020 assessment of the program, provides an overview of the type of scientific and technical expertise that fellows provide in the executive, congressional, and judicial branches of the U.S. government according to their mentors.

Figure 8: Assessment of AAAS Fellowship Program (Source: AAAS)

There are similar programs in South America, Central America and the Caribbean managed by the Inter-American Institute for Global Change Research (IAI), in Africa managed by the African Academy of Sciences, and South East Asia managed by the ASEAN Foundation. There are also programs in the United Kingdom, Australia, Israel, Switzerland, and undoubtedly many more.

In the United States, new programs are emerging that focus more on information technology. It is these programs that can provide a basis for a new international program. These include the Congressional Digital Service Fellowship, the Congressional Innovation Fellowship, the Congressional Innovation Scholars, and the Presidential Innovation Fellowship programs. There may be similar programs international that I'm not aware of.

Conclusion

The recommendations from the AAAS report, which included participants from all over the world, provide a good summary of the key benefits of a potential International SDG Science, Technology, and Innovation (STI) Policy Fellowship Program.

Cultivate and network boundary-spanning STEM leaders around the world to engage at the science-policy interface.

- Establish more immersive science-policy engagement mechanisms to give scientists the tools to address complex societal challenges, especially in countries and regions where policymakers are not already well linked to the scientific community.
- Broaden the diversity of scientists and engineers engaging at the science-policy interface by expanding opportunities for and recruiting participants from underserved populations and geographic regions, as well as from a variety of disciplines, backgrounds, cultural perspectives, genders, and career stages.
- Create opportunities to network and forge connections among participants, alumni, funders, and administrators across communities to foster innovation and global collaboration.

Facilitate knowledge sharing and collaboration.

- Facilitate the exchange of information about activities and mechanisms so that current efforts can benefit from other models and experiences, and to inspire the creation of new mechanisms informed by successful practices.
- Strengthen science diplomacy and advance regional and global cooperation on science and technology policy by cultivating connections among national, regional, and international science and policy stakeholders.
- Establish an online global science policy resource and networking hub to provide centralized access to information, tools and practices, case studies, lessons learned, training and funding opportunities, events, and science policy jobs and related news.

Figure 9: Recommendations from Connecting Scientists to Policy Landscape Analysis of Mechanisms Around the World: Engaging Scientists and Engineers in Policy Around the World (Source: AAAS)

Such a program would need a home to bring people from many countries together, provide them with sufficient training, and provide them with linkages to a network of more senior scientists and engineers from whom they would seek advice. My thinking is that the Interacademy Partnership with 140 members from around the world, might well provide a home for the program. They already have in place regional networks (see Figure 10) and many already manage fellowship programs, and have already indicated an interest in establishing such programs.

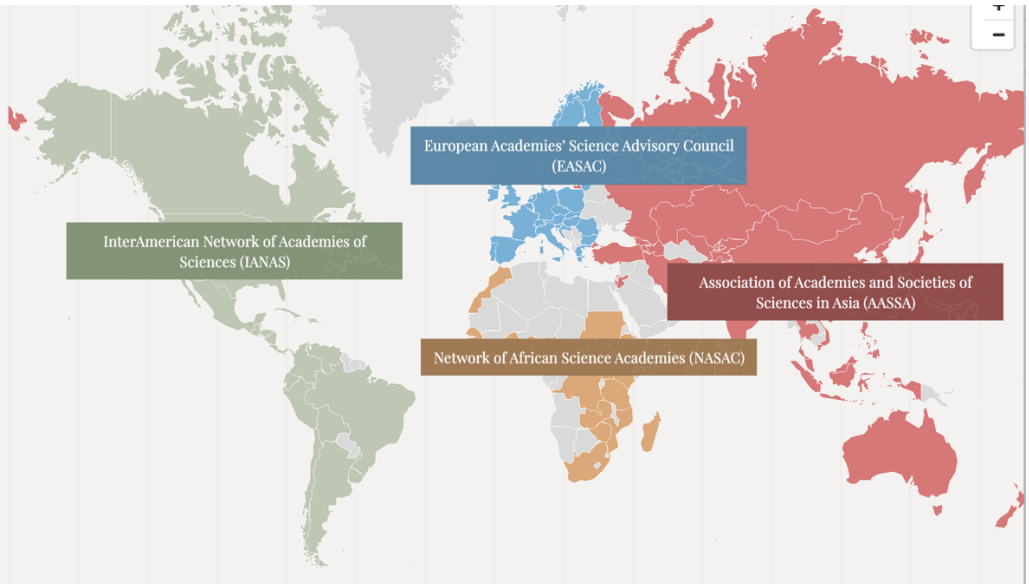


Figure 10: Interacademy Regional Networks (Source: IAP)

I've been working to establish similar programs at the state level in the United States. Many U.S. states are the size of countries, so the key elements to establish a state program (see Figure 11) may well provide a good model for an international program.

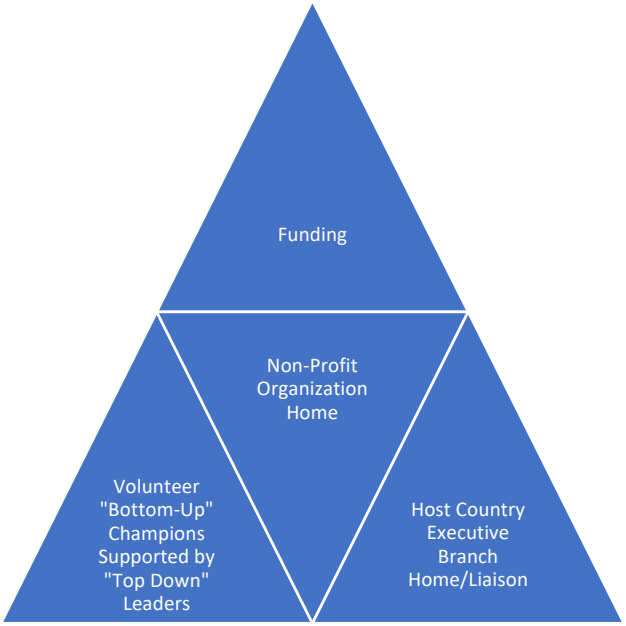


Figure 11: Key Elements Needed to Establish an International SDG Science, Technology, and Innovation (STI) Policy Fellowship Program

Source: Deborah D. Stine, Science, Technology, and Innovation Policy Analysis and Education

With the support of UNDESA, an International SDG Science, Technology, and Innovation (STI) Policy Fellowship Program can be effective in reaching the Sustainable Development Goals (SDGs), economically efficient, equitable to all those involved, and easy in terms of community and political leader acceptance.