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EXECUTIVE SUMMARY

Civic science, citizen science, participatory science...the increasing popularity of these terms heralds a more pluralistic, multi-stakeholder process to inform policy-making. This paper investigates the theories behind civic science and presents its relationship to sustainability, and to climate change in particular. It examines how a shift in the science-politics interface impacts research organizations and, more specifically, examines the role of research organizations in sustainable development diplomacy. The Global Alliance for Climate Smart Agriculture, newly launched after several years of incubation, is put forth as a case study on sustainable development diplomacy. CGIAR, a consortium of fifteen research centers, herein represents the research community at large. The role of research institutions in the formation and future of the GACSA is considered through a qualitative, interviews-based, assessment. Interviews with 26 representatives from six distinct stakeholder groups focused on CGIAR's influential leadership role, grappling with civic science, in the development of the GACSA.

THEORETICAL APPROACH

Defining Civic Science

In a 2003 paper in the *Journal of Global Environmental Politics*, Karin Backstrand asserts that the “science-politics interface” in international relations is outdated. She describes the traditional relationship between scientists and decision-makers as one in which “scientists inform policy-makers and policy-makers turn to science for knowledge and technical assistance,” and suggests “refram[ing] to include the triangular interaction between scientific experts, policy-makers and citizens.”^[1] This threefold exchange is civic science. According to Backstrand, “Participatory, civil, citizen, civic, stakeholder and democratic science are catchwords that signify the ascendancy of a participatory paradigm in science policy.”^[1]

The term civic science means many things to different people, including serving as “an umbrella for various attempts to increase public participation in the production and use of scientific knowledge.”^{i[1]} Neal Lane, former director of the United States National Science Foundation (NSF), suggests that “the civic scientist is one who engages the public in a dialogue about science and society.”^[2] Lane focuses on the scientist with a civic agenda, an increasingly outdated perspective. In a white paper published earlier this year, the NSF proclaimed, “Civic science is a framework and set of democratic and scientific practices that bring citizen scientists *and* lay citizens together in ways which build respect, that enhance capacities to act, and that generate positive public outcomes.”^{[3]ⁱⁱ}

The concept shares attributes with social learning, which focuses on facilitated knowledge-sharing: “joint learning and knowledge co-creation between diverse

ⁱ Also consider: citizen-activist, civic environmentalism, citizen science, citizen volunteer, community-based participatory research, co-management, democratic science, participatory science, people’s science, political ecology, public ecology, public science, scientist-activist.

ⁱⁱ Italicized here for emphasis.

stakeholders around a shared purpose, taking learning and behavioral change beyond the individual to networks and systems.”[4] As engaged citizens take an interest in the science-politics interface, it evolves beyond the circumscribed relationship between scientific experts and policy-makers. In addition to Backstrand’s interpretation, the following research builds on the definition of civic science provided by Professor Jurgen Schmandt: the process of linking experts and stakeholders in planning social, economic, and environmental improvements.[5]

Backstrand places the traditional science-politics dynamic in the context of regime studies, which aim to mitigate risk through diplomacy and multilateral negotiations. This theory of regime formation relies on an epistemic community.[1] Commonly recognized as a network of expert professionals, epistemic communities are often viewed as the authoritative voice on an issue considered by policy-makers.[6] Scientific interaction with the lay community was long rooted in a deficit model in which non-scientists were seen as “empty vessels” to be educated.[2]

The authority given to the scientific community grows out of positivism — the belief that knowledge is fundamentally a description of experience. A positivist definition of scientific knowledge is, in the simplest terms, limited to phenomena that can be observed and measured. Civic science relies on a shift to post-positivism and critical realism, along with constructivism. The theory first takes a critical approach to the notion that observations are certain and, second, asserts that observations are impacted by perception.[7] The constructivist position muddles “the boundaries between institutions of scientific expert advice and policy-making,” and in so doing, undermines the definitive authority of the epistemic community.[8] Consequentially, civic science allows for a broader interpretation of knowledge and empowers lay people with its production.

Some trace the roots of civic science to three academic disciplines: science and technology studies, civic studies, and complex systems theory.[3] From these distinct fields emerges an emphasis on co-production of knowledge and the benefits of engagement. Together, they imbed civic science with the notion that one’s values are implicit in scientific inquiry, civic agency is imperative to enacting change in social and political environments and scientists remain key actors in a more democratic process. Rather than understand science as knowledge to be taught, it is increasingly understood as interactive and contextual.[3]

Though not necessarily oriented at disruption, civic science may be perceived to challenge the intrinsic, top-down, power structure that elevates scientists and experts. Fundamentally, the goals of civic science attempt to diversify participation, broaden the profile of citizen scientists, and deepen public scientific understanding.[9]

Civic Science and Sustainable Development Diplomacy

The World Summit for Sustainable Development in 2002 was a milestone in the contemporary history of civic science.[9] Designed around newly conceived “Type II” Partnerships, the World Summit convened international organizations, civil society, and the private sector in addition to traditional government delegations.[10] Though evidence of earlier civic engagement exists — the World Bank, for example, designed projects with two teams: one comprised of experts and the other, citizens — the World Summit elevated the concept and reached a far broader audience.[5] Jonathan Lash, former President of the World Resources Institute, lauded the Type II partnerships as:

The first stirrings of a new way of governing the global commons - the beginnings of a shift from the stiff formal waltz of traditional diplomacy to the jazzier dance of improvisational, solution-oriented partnerships that may include non-government organizations, willing governments and other stakeholders.[11]

In the years since the Summit, the number of global environmental regimes has steadily increased along with “negotiated science” in which scientific expertise is a regular part of multilateral diplomacy.[9] At the same time, there is a growing expectation that this scientific expertise is multidisciplinary, holistic, and policy-relevant.[12] These standards are especially pertinent for issues related to climate change.

“Over the years, the role of stakeholders in global governance has shifted from simply being consulted in the 1960’s, to serving as backstage managers in the 1970s, to being protected and empowered in the 1980s, to being invited as partners in the 1990s, to the present state as practitioners carrying out initiatives on the ground.”
-United Nations Environment Program

Climate change, a complex socio-ecological problem, is recognized as a “wicked problem,” which demands academic, situated knowledge and the co-production of knowledge.[3, 4] Sustainable agriculture has also been described as a *wicked* problem: an issue facing obstacles to systematic change, fundamental challenges of complexity and scale, and structural barriers.[3]

Renown economist Elinor Ostrom increasingly focused on climate change and the need for a polycentric approach to action. She explains, “A polycentric system exists when multiple public and private organizations at multiple scales jointly effect collective benefits and costs...with active oversight of local, regional, and national stakeholders.”[13] Ostrom, underscoring the limitations of international efforts to address climate change, emphasizes the experimentation and learning enabled by a polycentric approach as varied policies are put in place.[14]

Rosina Bierbaum, Dean of the School of Natural Resources and Environment at the University of Michigan, makes a direct connection between the need for a polycentric strategy and the shifting role of science in sustainable development diplomacy. She laments that we “are not making progress in understanding vulnerability to climate

change or understanding what stakeholders want from science to aid decision-making.”[15]

The United Nations Environment Program’s 2012 Global Environment Outlook Report similarly trumpets collaborative research and knowledge platforms to “convene a science-policy interface forum with representatives from existing environmental assessments, scientific panelist and information networks to advance their connectivity and efficiency, facilitate ways of meeting the science-policy capacity needs of developing countries, strengthen data gathering and target the communication of scientific findings to various audiences.”[16] The report evidences the turning tide of expectations for sustainable development diplomacy, emphasizing the need for “dialogue between sectors as well as between different communities...[along with] private-public, cross-and multi-actor participation in international decision-making.”[16] Moreover, UNEP advocates “collective action by civil society, private sector actors, the media and academic and research institutions,” and references the power of social learning.[16]

Before a true shift in the policy-science interface can occur, the multiplicity of stakeholder groups must be validated. As noted in a review of civic science and forestry, “Few environmental scientists still write about a singular and undifferentiated public, yet fewer still have focused on ethnicity, class or gender as structural categories of differentiation when evaluating how publics have been or should be incorporated into planning efforts.”[17] While the pluralistic nature of civic science is fundamental, the engagement of non-traditional communities, especially when tackling *wicked* problems, is paramount.[18]

Negotiated Science and Agriculture

Agriculture — both a contributor to climate change and vulnerable from the affects of climate change — has proven too complex an issue to sufficiently advance in traditional, government-to-government negotiations. The place for agriculture in the United Nations Framework Convention on Climate Change (UNFCCC) has been a matter of contention. Some stakeholders advocate for more comprehensive attention to the relationship between agriculture and climate change within the UNFCC, while others see the wisdom in addressing agriculture indirectly.[19, 20]

Article Two of the UNFCCC encompasses agriculture, noting that the need to stabilize greenhouse gas emissions “should be achieved within a timeframe sufficient to allow ecosystems to adopt naturally to climate change to ensure food production is not threatened.”[21] Agriculture was addressed through a draft text within the Ad-hoc Working Group on Long-term Cooperative Action (which was later blocked), and through the Clean Development Mechanism, Nationally Appropriate Mitigation Actions, and Technology Mechanisms and Technology Needs Assessments.[20] To many, agriculture seems to be continually “marginalized” in climate negotiations.[22] However, attention to the intersection of agriculture and climate change is rising and political will is driving action outside of the UNFCCC.

The Earth Systems Governance Project, a decade long social science research endeavor, captures the strategic shift, pushing for a “transformative structural change in global governance,” and specifically, “the coordination of climate change adaptation in food systems.”[23] Their findings advance the argument for a polycentric system committed to civic science. They recognize “traditional intergovernmental processes face increasing pressures for access to decision-making by all affected parties and improved accountability,” and suggest “novel mechanisms to enhance learning and knowledge diffusion across stakeholders.”[24] To meet this need, the Earth Systems Governance Project propose a decentralized system with various hubs and multiple levels of authority overseeing broad networks. Such a governance structure can maximize knowledge input and capture diverse experience while remaining flexible to adaptation.[23]

CGIAR, a global network or consortium, of fifteen research centers collaborating to improve food security, began to advocate for partnerships that echoed this shift in sustainable development diplomacy. In 2011, in association with the Meridian Institute, CGIAR proposed “innovative institutional arrangements that facilitate communication and integration across entities and with key stakeholders.”[19] The same year, along with the Earth Systems Science Partnership, CGIAR suggested:

The development of a shared vision amongst technical experts, policy-makers and practitioners; analysis of high priority mitigation options and impacts; coordination of efforts and increasing flows of funding, initially by leadership from anchor donors who invest through bilateral agreements and multi-lateral programme.[20]

CGIAR, the world’s largest alliance of agricultural researchers was championing a multi-stakeholder, knowledge-based, initiative to advance food security in the face of climate change.

CASE STUDY

The Global Alliance on Climate Smart Agriculture Emerges

The recent launch of the Global Alliance for Climate Smart Agriculture (hereafter the GACSA or the Alliance) followed four years of organizational momentum by a small group of national governments, the World Bank and select United Nations agencies.ⁱⁱⁱ CSA aims to “develop the technical, policy and investment conditions to achieve food security under climate change.”[25]

The first Global Conference on Agriculture, Food and Nutrition Security and Climate Change took place in The Hague, in 2010, hosted by the Government of the Netherlands and the World Bank. A year later, Wageningen University held the first

ⁱⁱⁱ Research on “Climate Smart Agriculture” predates the movement behind the Alliance. The origin of the phrase “Climate Smart Agriculture” (CSA) is attributed to the Food and Agriculture Organization.

Global Science Conference on Climate Smart Agriculture. According to one of the early leaders, there was the perception that research organizations were hesitant to engage in the global meetings.[26] For that reason, parallel scientific conferences were organized, with the specific intent of inviting and engaging the research community.[26] In the spring of 2012, the University of California, Davis led the Global Science Conference on Climate Smart Agriculture. That fall, the second Global Conference on Agriculture, Food and Nutrition Security and Climate Change took place in Hanoi, Vietnam. The third Global Conference on Agriculture, Food and Nutrition Security and Climate Change met in Johannesburg, South Africa in December of 2013.

By many accounts, it was in Johannesburg that the movement began to take off. David Nabarro, Special Representative of the Secretary-General for Food Security and Nutrition, delivered remarks on behalf of Secretary General Ban Ki-Moon.[27] Still, the goals of the conference remained unknown to some stakeholders, and the notion of an alliance was amorphous.

“I count on leaders from government, finance, business and civil society to work together on solutions to the challenge posed to food and nutrition security by climate change. That is why I welcome your proposals to develop a Climate-Smart Agriculture Alliance.”

-Secretary General Ban Ki-Moon

Looking back to Johannesburg, an investor remarked, “There were certain key stakeholders missing...There were no development banks...The country representation at that time was not very strong. Some stakeholders came in very late to the conference, only in the summary meetings.”[28] At that point, a researcher reflected, “There was no clear structure about where this process is leading and what we are really looking for.”[29] The pace quickened through 2014, with several global meetings leading up to the official launch of the Global Alliance on Climate Smart Agriculture (see text box for details).

2014 International Preparatory Meetings for the GACSA

- Consultation on the Framework in The Hague, The Netherlands - April
- Ascent Meeting in Abu Dhabi, United Arab Emirates - May
- General Meeting in Hanoi, Vietnam - June
- African CSA Meeting in Malabo, Equatorial Guinea - June
- Partners Meeting in The Hague, The Netherlands - July

The GACSA was officially announced on September 23, 2014 at the United Nations Climate Summit. The high-level event welcomed forty ministers and organizational leaders from civil society, farmers’ organizations, the private sector, and the research community. The following day, senior officials and high-level representatives from various stakeholder groups around the world celebrated the first GACSA signatories. At

present, there are seventy-two partners in the GACSA.[25] Dr. Juergen Voegelé, Senior Director of Agriculture Global Practice at the World Bank, called for a systems approach to CSA that fully engaged civil society.[30]

The framework of the GACSA embodies the tenets of civic science and sustainable development diplomacy.[31] It aspires to serve “governments, farmers, scientists, businesses, and civil society, as well as regional unions and international organizations.”[31] While at the time of this research, the specific mechanisms of the governance structure remain undecided, the framework claims to “enable governments and other stakeholders to make these transformations in ways that bridge traditional sectoral, organizational and public/private boundaries.”[31] The framework recognizes, “Context-specific priorities and solutions need to be aligned with national policies and priorities, and be determined based on the social, economic and environmental conditions at site.”[31] Membership to the Alliance is open to “governments (from countries at all levels of development), businesses, farmers’ organizations, civil society groups, producer organizations, research bodies and intergovernmental entities.”[31]

After four years of open meetings, direct engagement from the public sector to the scientific research community, and the gradual increase in stakeholder participation the Alliance is an excellent test case for the changing science-policy interface.

CGIAR and the GACSA

CGIAR has been involved in the movement behind the GACSA since the first meeting in The Hague in 2010. Since then, they have participated in every global conference, volunteered to co-facilitate one of three action groups formed in Johannesburg, and hosted the inaugural meeting in New York. The centers that make up CGIAR have incorporated climate smart agriculture into their research for several years and published numerous authoritative papers on the subject. CGIAR is both a signed member of the GACSA as a consortium and represented by individual centers as independent signatories.

Long recognized for their commitment to knowledge-sharing platforms, CGIAR “demonstrate(s) the potential of stakeholder advice platforms and provide(s) support for knowledge-sharing structures at the regional level...these initiatives could be emulated to scale up much needed environmentally sustainable technologies.”[16] Expectations that “research-for-development bodies” like CGIAR connect knowledge to evincible action are increasing. So too is the understanding that for research to “result in beneficial changes in behavior, policies and institutions,” especially for *wicked* problems, “research outputs need to be much better informed by and engaged with the processes through which individuals, communities and societies learn and adapt their behavior in the face of change.”[4]

The GACSA’s Knowledge Action group, co-led by CGIAR and the Food and Agriculture Organization of the United Nations, evidences a commitment to participatory processes. It is recognized as the most productive and transparent of the three GACSA action

groups.[32] Two open, online, consultations to identify knowledge priorities were held in 2014 along with a working group session at the Consultative Meeting in Vietnam in June 2014.[25] Over 500 respondents participated in the first Knowledge Action working group representing scientists, program managers, policy-makers, financial and communication professionals and farmers.[33]

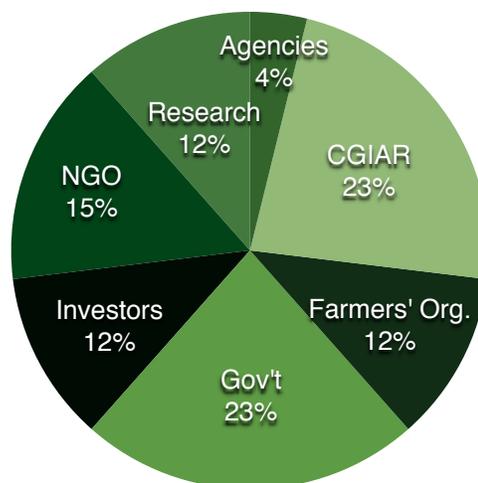
Research Design and Methodology

By several indications, the facts of CGIAR's leadership in the GACSA do not reveal the extent of the organization's engagement in the lead up to and immediate aftermath of the official launch. To better understand the true role of CGIAR in the GACSA and, specifically, how the research organization is meeting, or failing to meet, the demands of the new science-policy interface reflected in the stated goals of the GACSA framework, a qualitative assessment aimed to capture stakeholder reflection.

Forty-four stakeholders were invited to participate in a brief interview from October 8, 2014 to November 20, 2014. A total of 26 interviews were completed during these six weeks, resulting in a response rate of nearly 60 percent. Notably, only three of 26 participants were women.

Interviewees represented a cross-section of actors inside and outside of the research community, international agencies, farmers' organizations, government, investors, and non-government organizations. Outreach began after the launch of the GACSA, using a purposeful, non-probability snowball sampling technique to conduct semi-structured interviews. The average interview required approximately twenty minutes; the majority were conducted via phone or Skype. Two respondents sent in written comments via email due to scheduling constraints.

Interviewees by Stakeholder Group



The following four questions were posed:

1. In brief, how would you describe your role and the role your organization has played in the formation of the GACSA?
2. How would you describe stakeholder participation in the formation of the GACSA?
3. What role have research organizations, and CGIAR in particular, played in the development of the GACSA?
4. The language of the framework includes a broad list of stakeholders, aims to tackle a diverse list of environmental services (agriculture, forestry, fisheries,

food systems) and social policies, and aspires to enact change at numerous levels. With these stated goals in mind, what role do you see research organizations, and CGIAR specifically, playing in the GACSA moving forward?

Interviews were transcribed and factual data was cross-checked to ensure accuracy before being analyzed for emerging themes. Field notes and conference materials were referenced as secondary sources.

Civic Science and the GACSA

To gauge interviewees' familiarity with the principles of civic science, they were asked about general stakeholder participation. Following, they were asked about CGIAR's role in the formation of the GACSA, encouraging reflection on the recent past. Qualitative analysis revealed CGIAR played four principal roles: (1) as a standard bearer, (2) in outreach, (3) expediting knowledge sharing, and (4) by leading from behind. The final question was forward-thinking; participants considered the role they foresee CGIAR playing in the future of the GACSA. There was a shift in the responsibilities protected for the research institution. Noting the promise of a GACSA secretariat, participants expect less need for organizational leadership and look to the CGIAR team to serve the GACSA as (1) experts, (2) liaisons, and (3) through strategic communication.

Stakeholder Participation

Nearly every respondent commented on stakeholder participation. The issue, a regular topic of conversation in the hallways and during coffee breaks at conferences, had been elevated to a matter of open debate by a public letter from a group of civil society organizations unwilling to sign on to the Alliance. Some of those in opposition felt they had "constructively engaged [in the GACSA] in good faith for several months...[but] the concerns have been ignored."^[34]^{iv} From the agency perspective, there was at once an emphasis on the value of inclusivity and acknowledgment that "there could be even a better balance...more outreach to specific regions and also to civil society."^[32, 35]

One government representative, active from the inception of the GACSA, identified stakeholder participation as a key element in determining the success of the Alliance. This same person believed that the stakeholders from academia, civil society, NGOs, and the private sector were well represented in preparatory meetings.^[26] Others were more critical about the process. A second government representative said, "Initially, of course, we sort of excluded certain groups...by the final meeting in The Hague, I think we had a very healthy mix of representation, if you look at the national governments..."

^{iv} Civil society opposition to GACSA questions the multi-stakeholder planning process behind the Alliance. An important distinction must be made between the role of civic science in the GACSA and the role of research institutions in an era of civic science. The former is outside the scope of this paper, which assesses a single case study of the research community: CGIAR in the GACSA. Stakeholder participation in the GACSA is considered here to contextualize further analysis.

from the private sector, small holder [farmers], all different stakeholder groups.”[36] A third government representative plainly stated that there was “not full participation from all of the stakeholders groups.”[37]

Within CGIAR, a distinction was made between overall engagement in the GACSA and outreach and participation in the working group process. The CGIAR team noted the limited number of stakeholder groups targeted for general participation at the outset of the process:

Political leadership pushing for the formation of the Alliance, focused most attention on two types of partners: one is country governments and the other is corporate partners. There has perhaps been less attention to inclusion of very important groups, particularly producer representative groups and civil society representative groups.[38]

The impact of targeting (or perception of targeting) such a narrow set of stakeholders is ongoing. As one CGIAR staff person noted, “In the initial formation, it [stakeholder participation] was quite weak...Part of the reluctance from civil society organizations... may come from the fact that at the outset, it was not designed with a broader base... And, I probably think it should have a broader basis.”[39]

Many in the research community share the perspective that though stakeholder participation has improved, there are not “enough practitioners involved, [not enough] farmer organizations... too few people who are directly engaging in CSA.”[40] Investors were among the most direct, with one critic dismissing stakeholder participation as, “patchy, and that’s being generous,” and describing the process as “lack[ing] transparency.”[40] Among investors there was both skepticism and recognition of improvement over time.

In the South Africa conference, I was a bit surprised that there were certain key stakeholders missing...But, in terms of participation of civil society and others, I think that has only, step by step, materialized, and I think we are still not at a point where...it has been a completely participatory process...The fact that there is still a big group of organizations who are opposing this, indicates a bit more that they maybe don’t quite understand what it is about, or what the Alliance is doing, what its work program is.[28]

Representatives from farmers’ organizations allowed that the process was open to stakeholders who wanted to participate.[41] Notwithstanding, at the global level, resource constraints were identified as an obstacle to participation. The difficulty of consistently attending meetings scheduled around the world disproportionately impacts smaller organizations.[42]

For some, the openness of the GACSA was both inviting and led to doubts about accountability. Echoing concerns raised by the group of civil society organizations unwilling to sign on to the GACSA, one farmer representative stated:

The Alliance in formation has been open and welcoming to all stakeholders in agriculture. A range of stakeholders participated in its making. This is its strength, but also raises apprehensions. Will big wealthy corporates with profit making objectives ultimately have a stronger voice than civil society organizations and small holder farmer organizations? On what criteria will investments be made? Will agro-ecological solutions get the recognition, investment and support they deserve? What actions will be enabled through the GACSA?[43]

At present, uncertainty around membership criteria has led critics to dismiss the GACSA as a paper tiger, another instance of greenwashing in the evolution of mainstreaming environmental issues.[34] The narrow scope of actors involved at the beginning of the movement casts a shadow over the GACSA. In the past, the scientific community may have defined the space allocated to non-government actors. At present, the role of the research community is more nuanced.

The Role of Science in the Formation of the GACSA

The research community, and CGIAR specifically, grew increasingly involved in the movement to form the GACSA. As one government representative explained, scientific organizations were perceived to be hesitant to support the initiative. Two conferences specifically dedicated to the scientific community aimed to promote the Alliance among scientists and to explore the potential for research in CSA.[26] As momentum grew, CGIAR became a visible leader advocating for an Alliance and taking on four roles in the formation of the GACSA.

As a Standard-Bearer

The notion of research organizations, and CGIAR specifically, as standard-bearers was articulated time and again. When read at face value, this role is resonant of the traditional science-policy interface in which scientists are the authority. As one CGIAR researcher said, “to provide the scientific basis for defining what CSA actually means, that’s the core role of the research organizations.” The speaker positioned this expertise as a service to the integrity of the GACSA, suggesting that “identifying what is and what is not CSA is essential to avoiding greenwashing, which is already the main accusation of a lot of civil society organizations.”[44] A government representative stated plainly that CGIAR “provided some credible definition, you have a credible system that can provide an objective definition of what we are talking about.”[45]

Representatives of farmers’ organizations seemed to agree. One representative explained that the on-the-ground research and practical experience that CGIAR brings to the GACSA is a critical input, considering the science-based nature of the discussions.[41] Another went further, “Without science we are groping in the dark...we respect the whole of science in research in giving us the situation as it is now, and helping us project what the future will be like, as well as in designing those innovations and technologies that will be able to deal with climate change... Indigenous knowledge

is not going to be enough. In any case, indigenous knowledge does not change as fast as the knowledge that is required to manage fast-changing climate issues.”[42]

Here the discourse around scientific expertise recognizes both the potential value from other stakeholders and the challenges of incorporating additional input in the face of the *wicked* problem of climate change. An investor, noting the unique structure of CGIAR as the only research organization principally funded by development institutions (including the World Bank and the European Commission’s Europe Development Fund), interpreted CGIAR’s commitment to invest in the GACSA as an endorsement of CSA as a means for development.[35]

In Outreach

CGIAR was an early champion for the creation of a CSA alliance. Yet, there was no organizational directive to foster stakeholder participation. As one member of the center leadership stated:

In terms of the more political side of what the Alliance is, what the membership is... [research organizations had] less of a role, [it] was driven more by the political agents.[38]

Though there was no internal mandate to influence stakeholder participation, others credited CGIAR’s leadership in shoring up the initiative. Many respondents cited the esteem in which they hold CGIAR as a significant indicator of both the integrity and the strength of the movement to organize the GACSA. A government representative explained, “In terms of governing and rallying everyone’s participation...[CGIAR is] participating in a system that, together with farmers, together with other practitioners is generating validated, scientifically sound knowledge and information, [and] has provided credibility to...the whole process.”[45]

According to one government representative, “It was good to see quite a few CG institutions involved in the stakeholder process, the consultation, the interventions and especially, a lot of discussion [that] happens during the [conference] breaks. It was those interludes, when we had breakout sessions and we would discuss offline [the] key issues, contentious issues, and we found that you could actually begin predicting how the Alliance would actually work.”[36]

Expediting Knowledge Sharing

In several interviews, stakeholders observed a third role for CGIAR as a liaison that expedites knowledge sharing. A farmers’ organization representative highlighted CGIAR’s value both as a nexus of technical expertise and an agile facilitator. The support of CGIAR enabled his staff to develop a more nuanced understanding of CSA and to more effectively engage local stakeholders.[46] As a CGIAR leader articulated:

One of the more important things in CSA is to break down silos between more academic research and farmers’ practice. One of the most important things about climate change is that you are in a situation where the goal posts, the kind of

environmental parameters, are changing very rapidly. Therefore, rapid learning, [and] rapid sharing of learning, becomes more and more important.[38]

Representatives from government, non-profit and farmers' organizations all observed CGIAR connecting diverse stakeholders and supporting regional, national, and subnational systems to advance the GACSA.[28, 45-47] The geographic expansiveness of CGIAR centers are seen as a tremendous strength for the GACSA; interviewees observed the strategic leverage of CGIAR's network to introduce potential allies and collaborators. Through consultative processes, CGIAR helped stakeholders arrive at "consensus about...the knowledge gaps that perhaps prohibit decisions and policy-making in CSA." [29]

One government representative observed:

We have hundreds of people speaking different dialects. What the alliance is hoping to achieve is to get us to understand each other and speak the same language. We all aspire to ensure that we have a very robust agriculture resilience framework within our countries, institutions, businesses, etc. But, there is no need to reinvent the wheel. There are best practices in other parts of the country that can be adapted locally in other parts. What the Alliance will do, is quicken that process, the cross-pollination of ideas. [It will] sharpen minds, sharpen ideas, [and] bring products faster through pilot phases. The discussion I've already begun with CCAFS, a key program within the CG system, shows me that the CG is critical to the GACSA.[36]

The capacity to attract new stakeholders and link vested partners to foster the overall growth of the GACSA falls outside the traditional science-policy interface. CGIAR is recognized working both to harness existing knowledge and to quicken the diffusion and adoption phase of CSA.

Leading from Behind

CGIAR's visibility in the formation of the GACSA raised the specter of the Alliance being dominated by the CG network; some stakeholders called for more equitable partnerships. An investor identified the unwelcome possibility that CGIAR would see the GACSA as a scientific forum in which academia would dominate and the platform would be largely an exchange of knowledge through conferences.[28] In the formation of the GACSA, CGIAR's organizational and fiduciary support for various meetings, active outreach, strong leadership in the Knowledge Working Group, and robust body of work on CSA has led to some confusion over their official role. Another investor went further:

The downside [of CGIAR's involvement] is that people perceive [the GACSA] as a research alliance because of the CGIAR...they need to bring others on more strongly...They mustn't dominate. We must avoid this becoming a research alliance...CCAFS support is crucial, we just need to make sure that people don't think, "Oh, it's CGIAR's Alliance." [48]

As the momentum to form the Alliance gained traction and stakeholder participation broadened, some saw a “healthy evolution” as CGIAR took a step back from the leadership of the GACSA even while hosting the launch in New York.[49]

The Future of Science in the GACSA

The language of the GACSA framework evokes the principles of civic science with a clear commitment to multi-sector stakeholder engagement across numerous levels of implementation. Respondents were asked to look ahead to the inception year, and consider the potential role for research organizations, and CGIAR specifically, as the GACSA moves forward.

As Experts

Representatives from CGIAR, along with others from the research community, government and farmers’ organizations, described more traditional responsibilities for science. CGIAR can inform policy-makers and program managers on what to do on the ground, based on existing best practices as well as develop future scenarios to illuminate multiple pathways to sustainable development.[26, 41, 50] A representative from the NGO community is looking to CGIAR to “identify practices that work, context specific, scale dependent...figuring out which are worthy of investment and what the barriers are (political, financial) and how we can overcome those barriers so success can be replicated and scaled up.”[49]

CGIAR is well positioned to provide technical support to government and international organizations committed to CSA. The fifteen CG centers have distinct expertise, ranging from agroforestry to rice cultivation, and can contribute both systemic knowledge and identify points of connection among interested parties.[51] CGIAR can provide, for example, technical backstopping as the 25x25 Initiative in Africa scales up.^v While there is strong political will to advance the initiative, there are currently few metrics and specific indicators necessary for evaluation.[29, 38]

CGIAR leadership plans to provide technical support, but also values the contribution of national research institutions to shift from domestic policy to implementation at the farm level.[38] Several respondents expressed an expectation that CGIAR help “bind” and grow the GACSA over the short-term, before national research institutions drive long-term change.[47]

As a Liaison

Respondents called on CGIAR to both generate and validate knowledge, exemplifying the evolving science-policy interface by liaising among members of the Alliance. CGIAR can continue to facilitate enhanced and deepened participation among diverse stakeholders. As one CGIAR researcher proclaimed, CGIAR must be “an honest broker

^v Vision 25x25 is the target set by the African Climate Smart Agriculture Alliance to engage 25 million African small-holders by 2025.

in negotiating different interests...Research can play a very important role in bridging between government interests, private sector interests [and] civil society interests.”[44]

Serving as an effective liaison will require an emphasis on inclusivity both as a leader of the Alliance and throughout CGIAR’s broad portfolio of work. CGIAR must conduct thoughtful outreach and continually assess how and when to integrate diverse knowledge streams into the centers’ research agendas. Recognizing the demands associated with a wide variety of stakeholders, a representative from one farmers’ organizations states:

I would like to see research organizations, and CGIAR itself, open up to ideas, efforts and experiences of the informal sector, to learn from NGOs and farmers themselves, and take forward promising local innovations, [including] evidence from agro-ecology and organic agriculture for more productive, risk-resilient, lower cost and low carbon agriculture.[38]

Another farmers’ organization representative underscored the difficulty of incorporating distinct types of knowledge when trying to address the ubiquitous issues related to climate change. The interviewee emphasized:

Science is a key driver and game changer in dealing with [climate change]. I know there are people who are serious advocates of indigenous scientific knowledge...and yes, it is part of the arsenal tools that we will need. But, the nature of indigenous knowledge is such that it takes years to change and climate change is happening every day, every minute. So, it becomes, not completely obsolete, but not as immediately relevant.[42]

Others reinforced CGIAR’s potential as a “driver” of effective collaboration.[46] CGIAR leadership describes their future role in the GACSA as both:

A creator of knowledge, but also...a facilitator of the many other organizations who are generating, managing, and sharing knowledge...It goes well beyond a research role; it is a facilitation role [and] a promotion role. Even though we don’t usually present ourselves as an advocacy organization, we certainly would like to be flying the flag for CSA and enabling as many partners as possible to come on board, work together [and] get the funding they need. We can provide those kinds of platforms, an impetus and publicity.[38]

Some expect CGIAR to assess cultural frameworks and ensure CSA is implemented by marginalized stakeholder groups. CGIAR “needs to take on additional research especially to inform local adaptation planning where governance is a critical piece...to understand the sociopolitical dimensions related to the participation of women, youth and other socially differentiated groups as drivers of an inclusive and equitable CSA agenda.”[52] CGIAR may argue this work is underway. A recent report co-authored by the CGIAR research program on Climate Change, Agriculture and Food Security, CARE International, and the Technical Centre for Agriculture and Rural Cooperation identified

six obstacles to food security in an era climate change, among them was both the need to ensure equitable outcomes for women and to support markets and value chains for low-income producers and consumers.[53]

Through Strategic Communication

Many see a need for CGIAR to render knowledge captured on the ground accessible to both other researchers and the non-scientific community.[54] One CGIAR staff person succinctly linked their leadership on outreach and knowledge sharing, explaining CGIAR's "network and...knowledge [can be employed] to better inform those reluctant to join [the GACSA], [and to encourage] the civil society organizations to be more confident in the science we do. For me, the fears they have expressed many times are not grounded. But they keep expressing them, so it means the way we explain...[and] articulate our science, is not convincing enough for civil society." [39] This respondent partially attributes the opposition to the GACSA by some civil society organizations to a misunderstanding and a failure of scientific communication.[39]

Respondents articulated the desire for CGIAR to continue to reach out on behalf of the GACSA as well as the need for the CG system to be receptive to greater stakeholder engagement.

As one researcher outside the CG system explained, CGIAR must "improve much more on how they communicate their research results to other stakeholders, and

on the other hand, how to learn from the other stakeholders what the needs for research are...So far, a lot of research has been done that has not been applied, or that was not

Tracing Science from Research to Implementation

Dr. Shahid Naeem, Director of Science at the Earth Institute Center for Environmental Sustainability at Columbia University, is urging researchers to reconsider the insularity of the scientific community. At the CGIAR 2014 Development Dialogues, he emphasized the need to reevaluate the impact the scientific community can have in the field. A recent paper reviewed the "large arsenal of scientific papers" in the field of biodiversity and ecosystem function (BEF) to determine the flow of information and its impact. Despite being one of the most cited researchers in BEF, Dr. Naeem found the results disconcerting. The analysis identified the path from scientific literature to (1) other scientific disciplines, (2) funding streams, (3) popular literature, (4) legal and legislative work, and (5) environmental program managers. The authors found "major deficiencies in communication between those carrying out the fundamental science and those tasked with generating and implementing management objectives, conservation strategy, or policy." Their conclusion supports the need for civic science in an era of *wicked* problems. They determined that "if the BEF research community is to effectively inform managers and policy-makers in time to mitigate impending global problems, the needs of these customers have to be considered and impediments to communication must be recognized and overcome."

- Ed. Shahid Naeem et al.

relevant for other stakeholders or the relevance has not been recognized... Communication needs to improve enormously; [it's] not just the researchers, it's also the other stakeholders that need to improve.”[40]

Stakeholders see the opportunity for CGIAR to circulate information and, in doing so, quicken the “cross-pollination” process for CSA.[36] Some stakeholders look to CGIAR to translate success on the farm level to the investment community. To do so effectively may require an aggressive communication strategy among stakeholders. The GACSA is often described as a platform — a platform of exchange, a platform to galvanize action. Interviews reinforce the presumption that CGIAR will help craft the GACSA's central message and serve as a multi-dimensional pulpit for publicity.

CONCLUSION

The traditional science-policy relationship was informed by an epistemic view of the scientific community and a deficit-understanding of civil society. Civic science calls for greater stakeholder engagement and participatory planning processes. The GACSA emerged in the context of sustainable development diplomacy, a process rooted in the elements of civic science. While the word “expert” best described the conventional science-policy interface, today's stakeholders — including researchers as well as representatives from agencies, farmers' organizations, government, investors, and non-government organizations — use a plethora of terms to describe the many roles science can play.

The scientific research community, represented by CGIAR, is still seen as a standard-bearer. However, they are widely recognized for their leadership in outreach and their facilitation skills and ability to serve as a liaison are credited with broadening stakeholder participation. Fundamentally, CGIAR is considered an inclusive partner that works to expedite knowledge sharing among interested parties, and across sectors. In addition to providing technical expertise, stakeholders expect CGIAR to continue to serve as a liaison and an inclusive convener. Moreover, they see the need for CGIAR, and the research community at large, to broadcast communication throughout the network. As one representative from a farmers' organization summarized:

I see CGIAR as being completely indispensable to any efforts to...deal with climate change at different levels — at the tactical level, on the ground [and] at the micro level — but also in terms of converting that...knowledge into more codified arrangements that will enable wider uptake across the world. [CGIAR] facilitates sharing and learning...as well as using that information to feed into possible policy recommendations for government, banks...for all development support.[42]

In reflecting on the role of research institutions in the GACSA, a member of the CGIAR leadership explained, “Previously, the habit would have been, which many governments do, is gather a group of experts, researchers, scientists to tell us how to do it. Scientists put something on the table, and they are excused, and the policy-makers design the

law...[Today,] if we do research that is socially unacceptable, we are wasting our time.”[39]

The GACSA exemplifies an evolving science-policy interface. Whereas some may have expected a diminished role for science as the knowledge of other stakeholders is increasingly validated, the case of CGIAR in the GACSA proves otherwise. There is still an important, multi-faceted role for research institutions to play in sustainable development diplomacy. As the GACSA establishes a formal membership, an elected chairmanship and a permanent secretariat, CGIAR’s role will necessarily shift. CGIAR has a mandate from stakeholders to leverage their expertise, liaise across-sectors to facilitate inclusivity, and broadcast best practices in CSA.

Today, fundamental principles of civic science — broad and diverse stakeholder engagement resulting in the co-production of knowledge — are implicit in expectations for sustainable development diplomacy. Indeed, willing participants in tenets of civic science, even advocates, remain unfamiliar with the term “civic science” and its theoretical underpinnings. In many ways, an incremental normalization of civic science is taking place, rather than a radical up-ending of the epistemic community’s authority. There is still a great deal to be done to ensure lay people, especially those in vulnerable populations, are sufficiently empowered, welcome, or active in sustainable development diplomacy. Yet, it seems the democratization of the science-politics interface has sufficiently evolved to shift the standard operating procedure. The craft of policy-making now reflects a more intentional, interactive planning process. The lines between design and implementation are being blurred. Still, the expertise research institutions offer is recognized and sought out. Perhaps as civic science becomes more explicit, this expertise will be seen as one variable, among numerous equally valuable factors, in decision-making.

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