



Ethics, Diversity, and Inclusivity in G2P Research

## Synthesis of AG2PI Workshops

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### BACKGROUND

Sustainably supporting worldwide food production is a 'wicked problem' of immense scale and complexity. As such, there is an urgent need for novel ideas and technological innovations in agricultural research. One strategy for rapidly infusing new ideas into existing knowledge networks is by making these person-centric networks more diverse, data more accessible to relevant stakeholders, and by infusing current practices with the kinds of Ethical, Legal, Social, Ecological, and Economic (ELSEE) considerations that will transform agricultural genome and phenome research practices.

PSC held two workshops to advance the aims of the AG2PI (Agricultural Genome to Phenome Initiative) by conducting social science research to encourage cross-fertilization of G2P data and ideas and motivate agriculture focused analysis from an ELSEE perspective. We also created human-centered stakeholder maps, personas, empathy maps, and journey maps to help drive more successful communication with the public, potential funders, and other stakeholders. PSC works in a data-to-action framework - the average time between when something is published and when it gets put into programming is 17 years - PSC develops and promotes human-centered training and outreach opportunities to try to shorten that lag time, translating research to impactful decision-making and strategies that may be quickly implemented.

### WORKSHOP SERIES GOALS

The goals of the workshop series were to introduce the concepts of diversity and inclusivity in Genome to Phenome (G2P) research, to help AG2PI scholars identify key stakeholders to support diverse, equitable, and inclusive science. Through creative approaches like those utilized in these workshops, participants learned to see their research and activities from different perspectives because people have different backgrounds, experiences, training, and needs, and it starts to push and pull their research in new ways.

### EMBRACE EMPATHY, DIVERSITY & INCLUSION BY THINKING THROUGH THE PERSPECTIVES OF OTHERS

Participants co-created stakeholder maps and idealized end-user personas in the first workshop. In the second, they added depth of understanding through empathy mapping and journey mapping. Learning to think from the perspective of those created personas helped participants become more directly engaged in understanding diversity efforts as researchers.

- It was extremely challenging for research-based participants to think through perspectives of other stakeholders.
- There is a clear opportunity to set up a process to engage early with stakeholders to promote ELSEE through the entire research process and portfolio, not just one project at a time.
- International perspectives differ widely and expectations of increasing diversity and inclusion vary.

## KEY CONNECTIONS ARE MADE BY MEETING STAKEHOLDERS WHERE THEY ARE – OUT IN THE FIELD

Participants learned to establish priority areas for research by engaging with stakeholders early in the research process, answering a need that is based in real-world issues and encouraging end users to have a stake and a say in the research process. We utilized touch point analysis (journey mapping) to bring in more diverse ideas and promote positive interactions.

- It was a challenge for participants to find where direct linkages may exist between the AG2PI network and its research effort.
- For any given farmer anywhere in the world, that, it was a struggle to find a direct connection from participants to those out in the real world, or to their work. For example, all AG2PI members could revisit the Stakeholder Map to leverage the connections found in the *Active Supporters* quadrant to widen communications networks. The AG2PI leadership team could likewise meet to strategize improving access and action-oriented meetings with those stakeholders in the *Critical* quadrant to ensure stakeholders with the most power to affect change on behalf of AG2PI have all the details they need to achieve these goals.

### SUMMARY

Finding it hard to bring in new perspectives is not a problem that's unique to AG2PI. This is science-wide problem. The nature of science is we get specialized the farther along we go. The narrower the researcher's focus, the more valuable and irreplaceable results may be. But it also detaches researchers from some of their relevant stakeholder groups.

To better connect AG2PI team to their stakeholders, PSC took a human centered approach by developing four key personas that could serve as initial touchpoints for a variety of individual stakeholder models. These personas were co-created with participants in the first workshop, then further developed by PSC. The four personas are:

- **Scientist Susan** – A PhD researcher at a large university, aged between 45-54 years, passionate about the prospect of discovery within her field, and challenged by maintaining funding and navigating stakeholder relationships and managing her team.
- **Industry Ian** – A consultant for agricultural interests, aged between 35-44 years, passionate about increasing the general public's understanding of GMO production, and challenged by getting genomics research to the market faster, sell more, to ultimately make more money for his firm
- **Farmer Fred** – A self-employed farmer who attended some college, without earning a degree, aged between 55-64 years, passionate about the future of farming whilst connecting it to the past and the community, and challenged by adaption to changing climate and water scarcity.
- **Government Gloria** – A director of a program at the federal level, holds a Master's degree, aged between 35-44 years, passionate about shaping policies and programs to align with governmental interests in cutting-edge technology, and challenged by resource allocation and appropriation.

In the second workshop these persona models were utilized as representatives of real people in the world and participants developed empathy and journey maps by thinking through these personas, their needs, and their experience with AG2PI. Utilizing this approach with real-world stakeholders will help to spur new dialogue, new partnerships and new opportunities to make scientific discoveries to meet real world need.

With workshops like these, there was an opportunity to explore in a psychologically safe space as we brought in empathy and understanding of stakeholders' points of view. The workshops were designed to expand how participants think about their values, research priorities, data practices and strategic decision-making with the goal to accelerate innovation through more diverse, inclusive, and ethical research practices. As participants will



move into the future embracing new perspectives, ideas, new partners, and new stakeholders, they will have a more expansive approach to diversity and inclusivity. Through utilizing creative approaches like those in these workshops, participants began seeing things from different perspectives. Understanding interactions with themselves and with AG2PI that are personalized to the individual level of stakeholder offers vital insight because people have different backgrounds, experiences, trainings, and needs, and it starts to push and pull their research in new ways.

It is when seeking the equity piece of Diversity, Inclusion, and Equity (DEI) that brings stakeholders to the table. But to which table? One of the best opportunities to meet stakeholders where they are – giving them a chance to engage with AG2PI and engage in the research process because the work AG2PI does is valuable and important to them. This means researchers must be intentional in getting into the field of research, get out of the lab. Get out in the field and look back at the academy, look back at the lab, look at the research from the outside-in.

Researchers who engage with external stakeholders will learn to empathize with a set of more diverse perspectives, and may be offered fresh insight and exciting direction for further research. For example, AG2PI might encourage more direct engagement and outreach with people represented by the persona Farmer Fred all around the world. Physically meeting with farmers, perhaps through local extension offices or community farmer co-ops to hear their stories and voices directly on their experience may broaden opportunities to place sensors on their fields and open communication pathways. This would move translation of science to implementation forward and improve conditions and scientific knowledge for the farmers in the field once these key connections are established.

**PROJECT** Ethics, Diversity, and Inclusivity in G2P Research

**LEAD DEPARTMENT** Public Science Collaborative, Iowa State University, Ames, Iowa

**DATA INCLUDED** Results of two workshops held in November 2021, and February 2022

**MAIN FINDINGS AND IMPLICATIONS** Learn to see through your stakeholders' perspectives, get out into the field to make connections that will increase engagement at many steps of research process, and bring in diverse voices, ideas, solutions, and further research goals.

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## Evaluation Section

We measured the success of the project using evaluation tools within the *A-E-I-O-U* evaluation framework (Kemis and Walker, 2000). The acronym stands for "Accountability, Effectiveness, Impact, Organizational context, Unexpected outcomes", and was used to develop the evaluation framework of all aspects of our activities to measure success towards goals and objectives. Regular assessments and agile responses to unexpected outcomes informed and improved daily activities and workshop planning towards the goals of developing capability and capacity.



Table 1. *Evaluation of AG2PI Workshop Series*

<b>Novel &amp; Educational Training Activities Developed</b>	<b>Number of Interactions &amp; Ideas</b>	<b>Number of Products</b>
<b>Stakeholder Mapping</b>	Group identification of stakeholders <ul style="list-style-type: none"> <li>• Critical: 18</li> <li>• Important: 17</li> <li>• Active Supporters: 13</li> <li>• Informed: 9</li> </ul> Subtotal: 57 Ideas	1 Map with four quadrants describing the intersection of stakeholder influence and interest.
<b>Persona Creation PSC Persona Development Tool</b>	Participants each joined the online tool to select images that trigger stakeholder ideas. Participants then selected their top 5 images. Participants images then merged into one list for group ranking  Subtotal: 100 Ideas with the top 5 selected by participants	1 group ranking list
<b>Persona Creation Brainstorming</b>	Breakout Group 1: 49 ideas Breakout Group 2: 43 ideas  Subtotal: 92 Ideas	5 sets of slides with persona characteristics.  4 distinct stakeholder personas were developed from the results by PSC.
<b>Empathy Map</b>	Breakout sessions created four empathy maps, one for each persona. Note Scientist Susan's created as example prior to workshop <ul style="list-style-type: none"> <li>• Scientist Susan: 16 ideas</li> <li>• Industry Ian: 14 ideas</li> <li>• Farmer Fred: 30 ideas</li> <li>• Government Gloria: 14 ideas</li> </ul> Subtotal: 74 Ideas	4 Empathy Maps
<b>Journey Map</b>	Breakout sessions created four journey maps, one for each persona. These results stem from 5 specific touchpoints, and the feelings and experience associated with the three stages of pre-engagement, engagement, and post-engagement for each touchpoint. Note Scientist Susan's created as example prior to workshop <ul style="list-style-type: none"> <li>• Scientist Susan: 86 ideas</li> <li>• Industry Ian: 39 ideas</li> <li>• Farmer Fred: 54 ideas</li> <li>• Government Gloria: 53 ideas</li> </ul> Subtotal: 232 Ideas	4 Journey Maps
<b>Total: 5 Training Activities</b>	<b>Total: 555 Ideas</b>	<b>Total: 19 Products</b>

## Accountability

Accountability is whether we accomplished goals. We assessed this by identifying the number of people engaged, and the educational training tools, ideas, and products generated through the workshop series. See Table 1 for more details.

- Workshop 1: 58 Registrants from 15 countries, representing 52 total organizations, including two 1890 Land-Grant Institutions, and two Minority Serving Institutions (MSI). Participants: 28 (20 guests)
- Workshop 2: 86 Registrants from 27 countries, representing 79 total organization, including three Minority Serving Institutions (MSI). Participants: 32 (24 guests).

## Effectiveness

Effectiveness describes how well the goals are achieved. Positive feedback included a participant reaching out to utilize the work for the own groups, asking for templates and expressing clear satisfaction with the process and approach.

## Impact

Impact is best measured through the extent and depth of changes to mindset of participants and willingness to incorporate ideas to increase diversity and inclusion. With over 500 ideas produced over two workshops there is a clear willingness to try these novel approaches.

## Organizational Context

This qualitative criterion focuses on the organization and management of the grant experience, evaluating how it enables or impedes progress towards goals. The resubmission process for adding IDC was initially a hindrance as re-budgeting and associated reduction in workshops changed the layout of the workshops, but working with AG2PI leadership team was easy and they were very helpful throughout the workshop process, including registration management, advertising, recording and supporting virtual workshops. There was a larger than usual discrepancy between number of registrants and number of participants, this could be an item of improvement goals for AG2PI.

## Unexpected Outcomes

No matter the planning, unanticipated implementation issues arise in every project. Reviewing after the first workshop, for example, led PSC to discover that some of the participants had struggled more than expected in seeing diversity and inclusion experiences through the eyes of their stakeholders. PSC made changes to the second workshop to help build that skill for participants, adding empathy and journey mapping and concentrating on understanding the motivations of the personas developed. A second unexpected insight was the number of international participants, as the PSC team realized that thinking in terms of ELSEE and DEI is an American-centric approach. As there are no global standards for increasing diversity and inclusion this made for an exciting opportunity to learn from participants all over the world while showing us that a more international context is vital for planning trainings in the future.

## Reference:

Kemis, M. & Walker, D. (2000). The a-e-l-o-u Approach to Program Evaluation. *Journal of College Student Development*, 41(1), 119-122.

