frontiers | Frontiers in Sustainable Food Systems

TYPE Editorial
PUBLISHED 19 May 2025
DOI 10.3389/fsufs.2025.1612888

OPEN ACCESS

EDITED AND REVIEWED BY
Albie F. Miles,
University of Hawaii–West Oahu,
United States

*CORRESPONDENCE
Hale Ann Tufan
✉ hat36@cornell.edu
Vivian Polar
✉ v.polar@cgiar.org
Jacqueline A. Ashby
✉ jacqueline.ashby@cantab.net

†These authors have contributed equally to this work

RECEIVED 16 April 2025
ACCEPTED 25 April 2025
PUBLISHED 19 May 2025

CITATION
Tufan HA, Polar V and Ashby JA (2025) Editorial: Gender intentional crop breeding: from integration to institutional innovation. *Front. Sustain. Food Syst.* 9:1612888. doi: 10.3389/fsufs.2025.1612888

Editorial: Gender intentional crop breeding: from integration to institutional innovation

Hale Ann Tufan[1*†], Vivian Polar[2*†] and Jacqueline A. Ashby[3*†]

[1]School of Integrative Plant Science, Cornell University, Ithaca, NY, United States, [2]Consultative Group on International Agricultural Research (CGIAR), Washington, DC, United States, [3]International Development Consulting (USA), Washington, DC, United States

KEYWORDS

plant breeding, gender, institutionalization, participatory research, client-oriented breeding

Editorial on the Research Topic
Gender intentional crop breeding: from integration to institutional innovation

Gender-intentional breeding requires research ecosystems and institutions that directly address gender inequality. The kind of institutional innovation needed involves not only reshaping breeding programs' technical goals, objectives, strategies and intended impact, but also introducing new methods and ways of learning, and even new value systems. Two complementary Collections on Gender Intentional Breeding explore these challenges with the shared goal of providing an overview of factors that influence how, when, and why gender research can trigger changes in breeding priorities, processes and institutions. These insights draw on experience from diverse crops, organizations and geographies. This Research Topic, *Gender intentional crop breeding: from integration to institutional innovation* focuses on the contextual issues that determine the effectiveness of the approach. Research Topic One, *Gender Intentional Breeding Case Studies,* consists of case studies documenting experiences with gender-intentional breeding.

Gender-intentional breeding designs and deploys new crop varieties and animal breeds responsive to the needs of poor rural women and men, with the dual aim of improving gender equality and accelerating adoption. This requires breeding programs that recognize users' divergent demands, taking gender differences into account. Meeting these diverse demands requires analysis of whether different user groups, men and women in particular, have different needs and preferences for new plant varieties or animal breeds, and whether addressing these preferences can increase adoption and enhance benefits. Gender-intentional breeding is a subset of client-oriented breeding that sets breeding objectives based on current and anticipated user demand. It includes but is not limited to purely commercial criteria for the acceptability of new varieties or breeds.

The papers emphasize the need for plant breeding to transition from a traditionally supply-driven approach to one that is gender-intentional, demand-led, and participatory. By changing how breeders prioritize traits, varieties selected, and seed strategies developed to actively involve social scientists in decision-making, breeding programs can integrate social and gender considerations into their work. Programs should make sure that the design of new varieties, embodied in breeders' product profiles, takes into account the role of women in food systems and their constraints in accessing seeds and inputs. Several papers conclude that gender-intentional breeding requires integrating gender analysis into breeding objectives from early stages, ensuring that breeding programs consider trait preferences of both men and women in variety design.

Gender-intentional breeding requires new impact assessment metrics that measure breeding success on a broader range of criteria: impact should be based not only on agronomic performance but also on gender-differentiated adoption rates, effects on labor use and drudgery, especially processing ease, and food security. Furthermore, breeding programs should engage in targeted outreach to redress structural barriers that limit women's access to improved varieties. Breeding programs should also seek to influence policy to gain institutional support for women's participation in variety selection, seed multiplication, and dissemination. One key recommendation is to move beyond simple sex-disaggregated approaches and apply intersectional analysis to understand how gender, social, economic, and ecological factors shape trait preferences. Several papers stress the importance of co-developing product profiles with men and women farmers, even within the same household, to ensure that breeding targets reflect real and diverse needs.

The Research Topic highlights the value of novel participatory breeding approaches that involve a representative cross-section of value chain actors, and breeders in joint decision-making. It calls for innovative methods such as crowdsourcing information on varietal preferences to strengthen stakeholder engagement. Structural changes in breeding institutions are also needed, including hiring more women scientists and promoting interdisciplinary collaboration for gender research. The papers identify fostering transdisciplinary teams that combine breeding expertise with gender and social science expertise as one of the most essential transformations required.

Overall, plant breeding must move from a gender-aware to a gender-intentional model, actively working to overcome inequalities in variety adoption and access. This transformation entails cultural change in breeding organizations, so that gender considerations are not peripheral or add-ons but are integral to impactful breeding. Change of this magnitude requires leadership commitment, institutional incentives, and long-term funding, not only to integrate gender concerns but to embed them into lasting and transformative institutional change.

Author contributions

HT: Supervision, Methodology, Writing – review & editing, Investigation, Conceptualization, Writing – original draft, Formal analysis, Project administration, Funding acquisition, Resources. VP: Writing – review & editing, Investigation, Resources, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Conceptualization, Writing – original draft. JA: Writing – review & editing, Conceptualization, Investigation, Writing – original draft, Validation, Data curation, Methodology, Formal analysis.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. The authors are grateful to the CGIAR GENDER Impact Platform and the International Potato Center (CIP) all supported by the CGIAR Trust Fund Contributors https://www.cgiar.org/funders/; and the Gender Researchers Equipped for Agricultural Transformation GREAT partners who supported the documentation of this experience.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note