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Editorial: Women in pedometrics, soil health and security

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Editorial on the Research Topic
Women in pedometrics, soil health and security

Special appreciation goes to the Editors—Drs. Carolyn G. Olson, Samira Daroub, Sabine Grunwald—of the Research Topic '*Women in pedometrics, soil health and security*'. This topic was inspired by recent developments in the International Union of Soil Science (IUSS), with a special Gender Equity Session at the 22nd World Congress of Soil Science, Glasgow, Scotland (July 31 – Aug. 5, 2022) followed by the foundation of a new Diversity, Equity, and Inclusivity (DEI) Working Group under IUSS. The need to address gender equity and enhance gender parity in soil science were identified as important because it concerns women soil scientists and professionals around the globe. The study of soil health, soil security, and pedometrics have intersecting scientific, social, and cultural dimensions. Too often only scientific outcomes are reported and published in journals, yet soil science has not been gender-neutral which is addressed in this Research Topic. The United Nations Educational, Scientific and Cultural Organization (UNESCO) recognized that science and gender equality are essential to ensure sustainable development at global, national, and local scales. Soil health and security and their assessment using pedometrics are profoundly important for the sustainability and resilience of soil ecosystems.

A total of 5 papers were accepted for publication in the Research Topic '*Women in pedometrics, soil health and security*' which has already received significant attention.

Two of the papers explicitly addressed the situation of women in pedometrics, soil health, and soil security. The first article "A 360 perspective of women in soil science focused on the U.S." was authored by Grunwald and Daroub presents a holistic perspective investigating women and soils through multiple lenses: 1) Women and soils viewed through the collective lens of systemic institutional and organizational barriers, 2) Women and soils viewed through a cultural interpersonal lens emphasizing values and beliefs of people related to gender, equity, equality, and diversity, and 3) Women and soils individual personal voices and stories. Multiple strategies were presented to address the underrepresentation of women in soil science such as leadership development, mentoring, enhanced awareness and competencies related to gender and diversity.

The second paper that addressed women and gender issues in soil science explicitly focuses on data from Mexico. The article "Women representation in soil science: gender indicators in the University Program of Interdisciplinary Soil Studies (PUEIS-UNAM)" by

Hernández et al. emphasize the importance to include women's contributions to soil science research and education. Data showed that only 24% of top academic positions are women in Mexico suggesting a gender gap. The PUEIS-UNAM Program aims to address such gender imparity in interdisciplinary soil sciences. Although this program identified equality in the total number of women and men, it showed profound differences with low-rank jobs allocated to women with lower income devaluing women compared to men. The limited participation of women in higher paid leadership positions demonstrates gender imparity.

Three articles in the Research Topic were written by author teams dominated and under leadership of women as first authors. The first article "Investigating farmer perspectives and compost application for soil management in urban agriculture in Mwanza, Tanzania" was authored by Esmail and Oelbermann. The paper presents pathways for integrated soil fertility management considering both soil science and social science perspectives in a region in Africa that is rapidly urbanizing. The importance of organic amendments for soil quality and urban soil security was highlighted.

The second article "Sensitive measures of soil health reveal carbon stability across a management intensity and plant biodiversity gradient" by Martin and Sprunger focuses on temporal aspects of the stability of soil carbon(C) and soil C cycling. Sensitive soil health indicators that were identified include Permanganate oxidizable C, mineralizable carbon, and β-glucosidase activity that fluctuated temporally and were interlinked to weather changes throughout the growing season.

The third article "Restoring soil functions and agroecosystem services through phytotechnologies" by Dessureault-Rompré provides a review about phytotechnologies, especially how these living technologies can restore, conserve, and regenerate soil functions and ecosystem services. A phytotechnology toolbox with three pillars of agricultural practices and land management will help guide future restoration projects.

Author contributions

SG: Conceptualization, Writing – original draft, Writing – review & editing. SD: Writing – review & editing.

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.

The authors SG and SD declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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