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DEFINING THE "S" OF ESG IN ACADEMIA. A CASE STUDY OF THE ATHENA PROJECT

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Purpose: This paper attempts to define the social dimension of ESG in the field of scientific research and innovation. It focuses on analyzing the definition of the "S" factor and specific indicators related to measuring and monitoring institutional changes. All of this is presented from an academic perspective.
Design/methodology/approach: This research employs a case study approach focused on the Athena project, utilizing gender equality audits and specific measurement indicators to analyze institutional changes and gender inequalities in academia. It reflects on the effectiveness of some indicators in understanding complex social issues within research and innovation.
Findings: The study revealed the needs and risks associated with the implementation of the gender equality plan. It also clearly highlighted the need to raise public awareness of gender equality and, at the same time, the need to continuously identify and monitor the situation in this area. "S" should not be seen as a backdrop to current processes or simply reported as a curiosity, but rather understood as a strategy for institutional change aimed at removing barriers and increasing the efficiency of both the institution and its employees.
Social implications: The study represents an important step forward in the ongoing changes in the perception and understanding of the roles of individuals in society, especially in the context of legislative and organizational changes being introduced in the European Union.
Originality/value: The novelty of the article is primarily its innovative approach to the issue of gender equality and the implementation of GEPs in scientific institutions from the perspective of the ESG concept. The reflections and results it presents are the outcome of the project of a large scale including 8 European academic institutions that implemented their self-tailored Gender Equality Plans. Although the reported results are partial and focus only on selected aspects of a broader issue, they are a good starting point for institutions outside the academic sphere to build development and effectiveness based on diversity and equal opportunities among employees.
Keywords: gender equality plan, ESG, institutional change, monitoring and evaluation, gender indicators.
Category of the paper: Research paper.

1. Introduction

In light of the transformations occurring in today's world, sustainable transformation gains increasing importance for socio-economic development, and diversity becomes a subject of analysis across many fields and scientific disciplines. ESG evolves from the concept of sustainable development, referring to three factors: environmental (E), social (S), and governance (G) related to sustainable development and corporate governance (Cicirko, 2022).

ESG gains growing significance in recent years. This trend intensifies due to rising pressure from the environment, including changing expectations of investors, the financial sector, legislative changes, and growing social awareness.

Initially somewhat underestimated, the "S" dimension gradually receives increasing attention and recognition of its role within the ESG sustainability triangle. The "S" dimension appears in various initiatives such as European guidelines — the European Social Pillar of 2018 and the related Action Plan issued by the European Commission (EC) in March 2021. These two documents include twenty principles that define the EC's concept of the social dimension and outline necessary actions for their effectiveness. Alongside these two strategic documents on human and social rights, ESG principles appear in various regulations. The "S" dimension also applies to the academic environment conducting research and innovation and responsible for educating younger generations. The main question arises: how is the "S" recognized in research organizations? How should we understand and measure the "S"? What specific indicators define the "S" in research and innovation?

According to L. Becchetti et al. (2012), studying the social aspect of organizations involves assessing the typology of intersubjective and interorganizational relations that occur inside and outside the organization within the theory of change context. Silva (2023) holds that social factors should include the relational dimension of institutions with internal stakeholders (employees) and external stakeholders (e.g., local communities where the organization operates), as well as their effects both in terms of contributing to multidimensional employee well-being (job quality, occupational safety and health, training and development) and promoting local sustainable development.

One of the preferred approaches to initiating structural changes in academic environments has become, among others, Gender Equality Plans (GEPs). Considered part of the "S," GEPs represent an institutional change strategy that removes barriers in recruiting new staff, allows retaining and developing the careers of currently employed researchers, addresses imbalances in decision-making processes, and generates cultural change necessary to avoid potential biases and discriminatory practices. Effective equality plans lead to the transformation of gender-related practices and thus to structural change. To achieve structural change, GEPs should be more than just formally adopted institutional policies; they should represent evidence-based approaches.

To address this complexity, one of the primary GEP functions is to provide space and initiate reflection at both individual and institutional levels. The theory of change approach supports reflection at all stages of GEPs, ensuring that the core assumptions of the institutional change process are questioned and considered by various stakeholder groups involved in implementation (Wróblewski, Leitne, 2022).

The aim of this paper is to define the social dimension of ESG in research and innovation. We conduct a deeper examination of the definition of "S" and specific indicators related to measuring and monitoring institutional changes from an academic perspective.

The novelty of the article is primarily its innovative approach to the issue of gender equality and the implementation of GEPs in scientific institutions from the perspective of the ESG concept. The paper is based on a case study of the international Athena[1] project, which aims to implement Gender Equality Plans (GEPs) in European scientific organizations. We present reflections based on the results of an implemented gender equality audit and evaluation using specific measurement indicators. Moreover, we consider how useful measurements and indicators are in developing insights into a complex issue such as gender injustice in academia. We pose the question: what should we assess regarding individuals, institutions, and discourses when formulating claims about gender inequalities in research and innovation?

The empirical data for this paper derives from the case study of the above mentioned Athena project, where authors were part of the international team and were responsible for the evalaution and monitoirng system concept and implementation.

For the Athena project case study, we used a multi-method approach based on data collection from more than 30 Athena documents with key projects materials, including Staff questionnaire surveys, qualitative and quantitavive indicators, GEPs of 8 implementing partners from Spain, Portugal, Slovenia, Bulgaria, Romania, Slovakia and Poland, Athena internal monitoring reports on implementing GEPs in yers 2022, 2023 (in total 16 reports) and 8 evaluation reports. In total 33 documents. Thematic coding identified patterns related to monitoring and measuring of institutional change, defining particular indicators that allow to asses the institutional change. Moreover, more than four years participant observation was conducted during the lifetime of Athena project: from 1st of February 2021 to 31st of July 2025 during more than 50 follow up project meetings and events. Additionally, we were the authors of the Athena Evaluation and Monitoring concepts and toghter with all Athena partnering organizations (6 reserach performing organizations - RPOs and 2 Research Funding organizations – RFOs) defined more than 240 monitoring indicators.

2. Diversity and Inclusion as a part of the "S" dimension

The social element in ESG, in relation to organizational functioning, directly concerns people, primarily its employees, who represent the most important capital of the organization, but also indirectly relates to external stakeholders. In organizations operating in a globalized world, diversity gains increasing importance, and skillful management of this diversity is considered the highest level of human capital management (Przytuła, Krysińska-Kościańska, 2017). From the perspective of proper functioning and development of an organization, such "difference" should be treated as a value in itself, and the principles adopted by the organization should emphasize respect for and appreciation of this diversity. Diversity requires management, and organizations that manage it well build their competitive advantage more effectively.

Managing diversity means recognizing differences among people within and outside the organization and consciously utilizing the diverse potential of employees. The highest level of diversity management is inclusion (Draghi, 2024; Przytuła, 2020). Managers, when attempting to create inclusive workplaces, must take into account individual differences, needs, and perceptions to build structures and systems where employees feel appreciated and treated fairly (Draghi, 2024; Przytuła, 2020).

Employee diversity holds great significance in organizational management practice. Effective implementation of the social dimension within ESG can only be achieved by organizational managers if they possess a clear understanding of the concepts of diversity and equality, along with a working knowledge of how to manage these elements at every stage of human resource processes. This starts with an analysis of employee diversity, which allows the organization to assess who should be recruited in order to grow in a desired direction and meet strategic goals. It also includes workforce planning—taking into account imbalances in positions and the potential emergence of skills gaps. Recruitment and selection processes must be designed to ensure equal treatment and transparency: job postings should promote diverse teams, and both internal and external recruitment should follow fair procedures. Employee motivation and career development should also incorporate diversity issues, such as training focused on identifying and countering stereotypes. Furthermore, a well-prepared evaluation system is essential—one that is clear, equitable, and suited to a diverse workforce.

Monitoring plays a vital role in ensuring continuity and effectiveness. It involves planned, ongoing, and systematic collection and analysis of information on a given action or strategy. Monitoring offers leadership teams insights into the progress of implementation, helps assess outcomes, and flags current issues that may require intervention (Krysińska-Kościańska, 2017; Kwiatek, 2023).

In light of these observations, a key issue becomes the training of managerial staff in identifying the needs of diverse teams, as well as in developing the capacity to manage such teams and monitor relevant activities (Krysińska-Kościańska, 2017). Managers implementing

diversity management must learn to recognize and respond to individual differences in ways that ensure job security and performance, while actively preventing discrimination based on any form of difference (Leks-Bujak, 2014).

In the literature, diversity refers to all aspects by which people differ, such as gender, skin color, national and ethnic origin, physical ability, language, health status, lifestyle, education, and sexual orientation (Waligóra, 2018). These dimensions can be categorized as visible/perceptible (e.g., gender, age, race) and invisible/non-perceptible (e.g., knowledge, education, beliefs, religion). Recognizing the existence of diversity does not, however, equate to inclusion. Inclusion aims to integrate these various components in a way that ensures they complement and cooperate with one another. It involves taking action to empower employees by respecting and valuing their distinguishing characteristics (Przytuła, 2020).

Fostering inclusion requires acceptance of employee diversity, as well as empathy, openness to new ideas, trust-building, flexibility, and open and transparent communication on the part of leadership. One of the core elements that defines the "S" dimension within the field of diversity and inclusion is the issue of gender equality – both in terms of how it is understood and how it is interpreted.

3. The "S" dimension in academic practice. Why do we implement gender equality plans?

Gender equality remains a critical challenge for the European research sector (ERC, 2022). According to the She Figures 2024 report (EC, 2024a), despite achieving gender balance at all levels of education, the representation of women decreases as they progress to higher academic positions. Women hold only 30% of Grade A positions (full professorships), and even less in science, technology, engineering, and mathematics (STEM) fields—only 20%. A significant gender gap is evident in areas crucial to the EU's competitiveness: while gender balance is observed among researchers in higher education (44%) and the government sector (45%), women are significantly underrepresented in the business sector (22%), which employs the majority (57%) of EU researchers. In the overall workforce, women make up only 3.4% of scientists and engineers, with an even greater gap among the self-employed, where they constitute merely 25% of professionals in these fields.

Gender Equality Plans (GEPs) are currently the preferred approach to initiating structural change towards gender equality in research organizations. As part of the "S" dimension, GEPs are recognized as a strategy for institutional change—removing barriers to the recruitment, retention, and career advancement of academic staff, addressing imbalances in decision-making processes, and fostering cultural transformation necessary to prevent future

biases and discriminatory practices. Effective GEPs lead to a transformation of gender-related practices and, consequently, to structural change (Wróblewski, Leitne, 2022).

To achieve structural change, GEPs must be more than just formally adopted institutional policies—they must be based on evidence-driven approaches. Considering the above, in recent years research institutions have undertaken efforts to diagnose the state of gender equality, which has served as a starting point for the implementation of appropriate actions in this area. One of the key initiatives has been the development of institutional equality action plans based on respect for equality and diversity, the implementation of which aims to ensure equal and unrestricted access to scientific development for all employees. These actions are undertaken across the various stages of human resource management (as previously outlined) (Kwiatek, 2023).

Equality plans comply with binding legal regulations as well as with best practices recommended by the European Commission[2]. From the perspective of plan development, gender equality in the following areas has become particularly significant: horizontal occupational segregation (the concentration of women in specific fields, such as education), vertical segregation, including the so-called "glass ceiling" (limited opportunity for vertical advancement for women), and the "sticky floor" phenomenon (lack of advancement opportunities in low-status, traditionally "female" occupations such as secretary or cleaner). This is especially apparent in the STEM field (Gmurek et al., 2023; Hyży, 2017).

Among the reasons for this situation, cultural and social factors are most frequently cited, including the frequent reinforcement of traditional role models in both family and professional life. Against this backdrop, significant inequalities persist, particularly in relation to caregiving and family responsibilities predominantly borne by women. Traditions, stereotypes, patterns, and gender-based prejudices are deeply ingrained in ways of thinking and behavior (Hyży, 2017). Moreover, they often go unnoticed or are downplayed, and attempts to introduce change are perceived as a violation of the accepted system and established standards. Manifestations of deeply rooted bias—whether conscious or unconscious—continue to occur, contributing to the perpetuation of an unjustified competitive advantage for men in academia. This leads to an undervaluation of women's scientific achievements and excellence, which in turn negatively affects their future opportunities (e.g. effectiveness in securing funding, publishing, remuneration, or career advancement). Another unresolved issue at the institutional level is the difficulty of combining an academic career with personal life plans, particularly family life (Gmurek, 2023; Hyży, 2017)[3].

Such obstacles slow down academic careers—especially for women—and cause some to abandon this career path entirely. Barriers that hinder the reconciliation of professional work and family life are also discouraging for fathers who strive to be involved in both areas of life (Kwiatek, 2023). This may lead to a generational gap and the outflow of ambitious researchers from the academic environment (Gmurek, 2024).

As part of gender equality plans, research institutions are intensifying their efforts in five key areas identified by the European Commission, namely:

1. work-life balance and organizational culture,
2. gender balance in leadership and decision-making,
3. gender equality in recruitment and career progression,
4. integration of the gender dimension into research and teaching content,
5. measures against gender-based violence, including sexual harassment.

In this context, the monitoring of implemented actions and equality policies, as well as their effects on the organization, becomes particularly significant.

4. Monitoring and evaluation of GEPs for structural change management in the ESG concept

The implementation of gender equality measures in research-performing organizations involves interventions in complex systems, as they engage diverse stakeholders, affect other processes and strategies, and require action at various organizational levels. Accompanying monitoring and evaluation (M&E) help support these complex implementation processes by providing up-to-date information and insights into the status of implementation and enabling reflection on actual practices (EC, 2024b).

This makes it possible to identify practices that are not feasible or effective, as well as to pinpoint actors that hinder progress and success. In this approach, the monitoring and evaluation system is understood as a learning process that reflects implementation practices in light of specific cultural and structural contexts and provides essential information for adapting implementation strategies (Athena, 2022).

An evaluation matrix—comprising criteria, evaluation questions, and indicators—should be designed or adapted to reflect stakeholder diversity and ensure gender equality. Data related to women's empowerment is collected through a combination of qualitative and quantitative indicators. The development of indicators thus becomes a reflective exercise, and monitoring becomes a dynamic tool. It requires ongoing reflection on data gaps, the relevance of indicators, and the continuous refinement of gender indicators. An important step in the development of the M&E system is the design of a Theory of Change for the strategy, which maps out (Athena, 2022):

- the expected pathways of change in knowledge, attitudes, and behaviors related to gender equality,
- how these pathways lead to the desired impact,
- the underlying assumptions explaining the pathways and processes intended to lead to change.

The monitoring and evaluation accompanying the Athena project aimed to assess the GEP implementation processes, evaluate institutional progress, and identify structural changes resulting from specific actions. This approach fostered learning both within and between participating organizations, enabling continuous improvement. Key objectives included:

- comparing implementation practices and their outcomes across organizations,
- assessing the impact of actions through both ex-ante and ex-post perspectives,
- identifying organizational changes and benefits resulting from the implemented measures,
- enhancing the Athena learning environment through shared insights,
- adapting to cultural and structural contexts.

The Athena project's M&E system was designed to align with the specific GEPs developed by each partner organization and their corresponding actions. This included a conceptual framework for structural change and a flexible evaluation question matrix, which integrated different stakeholder perspectives. Reflexivity was a cornerstone of this approach, encouraging stakeholders to reflect on data, discuss results, and improve practices.

The M&E system focused on three main evaluation questions, which shaped the structure and process of the evaluation. The first question focused on shortcomings in implementation processes and aimed to highlight which practices proved effective, which challenges and resistances were identified, and how they could be addressed (Athena, 2022).

The second question related to implementation processes and operational practices, evaluating whether the implemented measures succeeded in achieving their goals. This question therefore placed strong emphasis on outcomes and accomplishments. The third evaluation question addressed the sustainability of actions.

M&E is a continuous process that begins and ends with the project or program and should focus on improving stakeholder satisfaction and meeting their needs. According to this methodology, Athena's continuous monitoring was conducted in parallel with the implementation of the GEP. The final impact evaluation compared the ex-ante status and ex-post perspectives following the interventions (Kamińska, Rudawska, 2023).

To fulfil the objectives of the formative evaluation, a variety of information from a variety of sources was taken into account. This information was gathered using the techniques of internal monitoring and technical reporting. For internal monitoring, the focus of the data collection was on internal organizational sources, such as regulations, strategies, action plans, monitoring and evaluation reports, and other data and documents, as well as the data collection methodology established by each organization for particular actions.

A combined analysis of quantitative and qualitative results was used to capture the status quo. The analysis of the outputs and achievements of the Athena GEPs for impact assessment was based on: (1) desk research and data analysis of the developed common database of quantitative and qualitative indicators; (2) analysis of three internal monitoring reports; (3) an online satisfaction survey to assess qualitative staff satisfaction.

As evaluation is a complex concept implemented in complex systems, the design and instrumentation of evaluations must consider these systems, i.e. contextual factors. The impact of an intervention is not only determined by the intervention itself, but also by its context. On the other hand, as gender inequalities differ greatly between fields and disciplines, interventions promoting gender equality and evaluation practices must take the specific disciplinary, organizational and national context into account.

As part of the impact evaluation process, satisfaction surveys were conducted using questionnaires among employees of each organization. The range of questions was defined in relation to each of the five required GE areas. One of the key issues explored in the survey was staff awareness of the gender equality awareness in their organizations. Another issue explored in the survey was the extent to which the gender dimension is integrated into academic and teaching activities. Respondents were also asked how they perceived the institution's commitment to promoting gender equality in research and teaching. A total of 1304 responses were received.

The ex-post evaluation was expected to provide a more integrated and meaningful picture of the project's overall achievements across all its aspects. Evaluation reports should include both descriptive analysis and quantitative information to support future planning and operations. Monitoring and evaluation play a critical role in the development and implementation of gender equality plans at both the institutional and individual levels. To fully harness this potential, the monitoring system must consist of indicators that represent the state of gender equality, refer to the specific goals and policies of the GEP (Wróblewski, Leitne, 2024), and also take into account the social, institutional, and cultural context. Equally important is the correct interpretation of the collected results.

5. Discussion

The availability of empirical data is of fundamental importance to the success of a GEP. Monitoring system mechanisms serve as essential tools for generating empirical evidence on gender equality developments and GEP implementation, enabling decision-makers to assess progress, refine strategies, and raise awareness of gender-related challenges. However, it should be noted that EU countries face a systematic lack of information in this area, due to either the absence or weakness of data collection mechanisms, but also due to a lack of a reporting culture (EC, 2024b).

A comprehensive gender analysis forms the basis for developing targeted policies that address gender imbalances and their root causes. It holds significant potential for supporting the reflexivity of implemented GEPs in both institutional and individual contexts.

To unlock this potential, the analysis should consist of relevant indicators that appropriately reflect the complex structure of gender equality and relate to the socio-political and institutional context, as well as the specific goals and strategies of the GEP.

In the case of the "S" factor, its quantitative measurement naturally relies on the simplest statistics. This may lead to the false impression that interpreting the obtained indicators is equally simple and, above all, straightforward. Such an assumption represents a pitfall, as seemingly obvious values of indicators may misleadingly suggest certain conclusions which, in reality, may turn out to be oversimplified or even incorrect.

To avoid such mistakes, it is crucial to fully understand the research context and grasp the complexity of the reality measured by the quantitative indicators. In particular, the following aspects must be considered:

- The process under investigation is dynamic and involves changes over time rather than being a one-time event.
- Responses to actions or changes may be delayed or extended over time.
- The initial state of the analyzed process may have differed significantly from its current state.
- The study may involve unidentified or unobservable causes (and consequently, latent variables).
- Collecting complete and targeted data in the sample may sometimes be limited or even impossible.

Thus, while indicators used to describe the "S" factor provide valuable information, their interpretation must account for the broader context and the complexity of the phenomenon being studied. Only then can the conclusions drawn be considered not only statistically valid, but also substantively accurate.

The importance of these aspects is illustrated by two examples. Although partially stylized, they directly refer to the findings of our assessments conducted at Jan Kochanowski University (UJK) between 2021–2025 within the framework of the Athena project.

Example 1

Let us consider the issue of the percentage of women serving on collegiate bodies within a university. Let us begin with the first perspective. It is generally expected that this percentage – highly significant, for instance, from the point of view of sound GEP policy – should hover around 50%. If we further analyze this issue in light of the decline of the patriarchal status quo, the expected value of this percentage could even temporarily exceed 50%. Moreover, if this concerns the highest-ranking decision-making bodies (e.g., rector's or dean's teams), a predominance of women can certainly be interpreted as appropriate and beneficial.

However, if we take into account bodies that, although equally important, are less prestigious and require significant organizational effort and high involvement (e.g., admission committees, audit bodies), then a significantly higher-than-50% share of women cannot be regarded as beneficial or appropriate. As a consequence, reporting the gender ratio in all

collegiate bodies in aggregate, without distinguishing relevant subgroups, may lead to distorted conclusions.

Now let us add the second perspective regarding the percentage of women in various committees. The target value of 50% is directly linked to certain “typical” or “fair” conditions. Yet, some existing, current or historical), objective factors may have resulted in a gender imbalance within the given group of staff. In such a case, it may be most reasonable to expect that a similar imbalance might, or even should, still be reflected in the elected bodies representing this group.

We may be dealing here with a deferred effect in a long-term adaptation process. If this is indeed the case, then a more appropriate approach is to diagnose and assess the direction of change over time, rather than evaluating a single point in time, such as the most recent state. In quantitative analysis, this approach translates into monitoring and interpreting the dynamics of indicators over time, rather than focusing solely on the very levels of these indicators.

Example 2

It is insightful to compare indicators with existing legal standards or internal regulations, even if these norms and regulations are objectively fully fair, including in terms of gender equality. Let us consider the issue of pay equity between women and men. In this regard, the standard practice is to measure the gender pay gap (GPG) based on average monthly gross salaries for a given year.

According to national legal regulations and the university’s remuneration system, base salary and overtime rates are essentially determined by position and seniority, not by gender or other sociodemographic characteristics. Despite this, the GPG at our university seems to suggest discrimination against women in this area. However, this turns out to be a misleading effect, resulting from several contributing factors. Among them, at least two key elements should be highlighted:

- the predominance of women at lower career levels and men at higher academic ranks, which stems from historical circumstances (incidentally, these circumstances are diminishing, as indicated by the dynamics of other indicators);
- the more frequent withdrawal of women, compared to men, from more intensive or additional work, largely due to the burden of family responsibilities and childcare, a typical social factor.

In light of the above, the pay gap indicator does not identify gender-based inequality within the salary system itself or in how it operates. Rather, it reflects the effects of other factors—specifically, the gender distribution across different staff categories. Two interrelated and positively correlated factors emerge as particularly significant: the proportion of women and men among academic staff, broken down by scientific promotion levels; and the gender distribution within the age structure of employees. These issues are clearly illustrated in Figures 1 and 2.

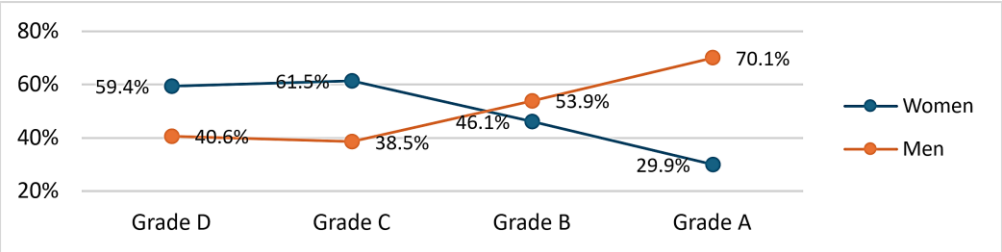

Figure 1. Proportion of women and men (%) among academic staff by scientific promotion grades (A – Professors, B – Habilitated Doctors, C – PhD Holders, D – Master's Degree Holders and Medical Doctors) in 2020.

Source: Gender Equality Plans (2022).

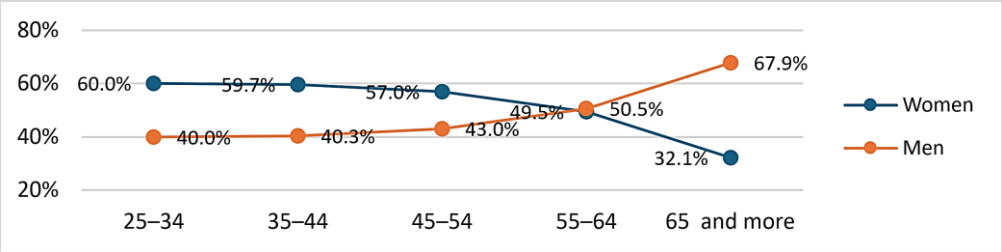

Figure 2. Proportion of women and men (%) by age groups (25-34 years, 35-44 years, 45-54 years, 55-64 years, 65 years and above) in 2020.

Source: Developed based on data collected for the Gender equality plan at Jan Kochanowski University in Kielce.

Above mentioned examples emphasize the awareness that the research methods adopted in gender and equity programmes in many cases may inadequately address institutional inequity, offering oversimplified analyses that ignore intersectionality, power structures and the discrepancy between policy and real-life experience.

This is in line with existing studies report that these programmes often rely on single-axis, gender-only analyses. For example, Locke et al. (2021), Nichols and Stahl (2019), and Powell (2018) describe approaches that use binary or narrative measures rather than multidimensional tools to capture the intersection of gender with race, class, ethnicity, and nationality.

Quantitative studies, such as those by Sheppard et al. (2023), reveal that available data are frequently limited by binary categorisations, lacking the nuance required to portray complex, layered identity dynamics. Furthermore, papers emphasising institutional inequity note that research designs often oversimplify academic contexts and fail to evaluate underlying power structures.

Studies by Vilhena et al. (2025) suggest that, while institutional context is acknowledged, there is little empirical measurement of factors such as informal norms, hidden labor and discrepancies between policy and lived experience. In summary, the reviewed studies and case of Athena project suggest that methodological shortcomings, such as the limited operationalization of intersectionality, the static treatment of institutional contexts, and the basic measurement of power, undermine efforts to capture the full complexity of academic inequity.

6. Summary

The "S" plays a significant role in the ESG sustainability triangle. However, it is not sufficiently recognized or understood by either management staff or employees in the academic environment. Based on research findings and case study observations from the Athena project: GEP, as a part of "S", should be understood as a strategy for institutional and cultural change aimed at removing barriers in the recruitment, retention, and career development of researchers; addressing imbalances in decision-making processes; and generating the cultural change necessary to avoid future biases and discriminatory practices.

In complex and dynamic research and innovation environments, where impact may have multiple causes, including cultural - and thus identifying causal relationships between interventions and outcomes is not straightforward, gender monitoring and evaluation should be interpreted as a living tool – one that is continuously reflected upon in terms of the reliability and validity of its indicators. To achieve this, an approach should be considered that aims to increase awareness of the cultural and socio-political context of GEPs, improve knowledge and understanding of the monitoring and evaluation process, and develop meaningful indicators referred to the theory of institutional change within GEP and its policies. Without this critical step, GEPs risk becoming symbolic or ineffective – either due to superficial implementation or the absence of a well-defined program theory (Engeli, Mazur, 2018). In the absence of a robust problem analysis, gender equality policies may result in inefficient resource allocation and limited impact, failing to lead to meaningful institutional change or effective management of the "S" dimension.

A comprehensive gender analysis provides a foundation for developing targeted policies that address gender imbalances and their root causes. It has significant potential to foster reflexivity in the implementation of GEPs within institutional and individual contexts.

The starting point for any organizational action should be the development of principles for the accurate and transparent collection of data, disaggregated by gender. To develop this potential, the analysis should consist of relevant indicators that adequately reflect the complex construct of gender equality and address the socio-political and institutional context, specific GEP goals, and strategies. As demonstrated by the GEP implementation monitoring reports, one of the challenges hindering a comprehensive gender-sensitive assessment was the lack of databases or their excessive dispersion[1].

The correct interpretation of the obtained results is crucial. In the case of the "S factor", its quantitative measurement, by its very nature, relies on the simplest of statistics. This state of affairs may lead one to believe that the interpretation of the obtained indicators is equally simple and, above all, straightforward. This is a trap, as seemingly obvious metric values can misleadingly suggest certain conclusions that may, in reality, prove simplistic or even inaccurate.

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Footnotes

[1] *Athena* – Implementing gender equality plans to unlock research potential of research performing organizations (RPOs) and research funding organizations (RFOs) in Europe. Project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement. No. 101006416, https://www.athenaequality.eu

[2] https://www.euraxess.pl/pl/poland/news/nowa-europejska-karta-naukowca, 20.02.2025.

[3] The relevance of these issues within the university environment was confirmed by the results of survey research conducted as part of the Athena project.