

Engineering programs in rural Spain towards 2030: Enrollment trends and the gender gap

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INTRODUCTION & AIM

This article examines the evolution of university engineering education in rural Castile and León, a region marked by population loss, gender gap and the exodus of young people, and compares it with the rest of Spain. The fundamental question is whether the system is generating sufficient human capital, both at the undergraduate and doctoral levels, disaggregated by gender, to support teaching, research, and the needs of an increasingly technical labor market.



ENGINEERING IN RURAL CASTILLA Y LEÓN

- CONTEXT:
- DEPOPULATION
 - YOUTH EXODUS
 - GENDER GAP
 - UNIVERSITIES IN A CHALLENGING CONTEXT



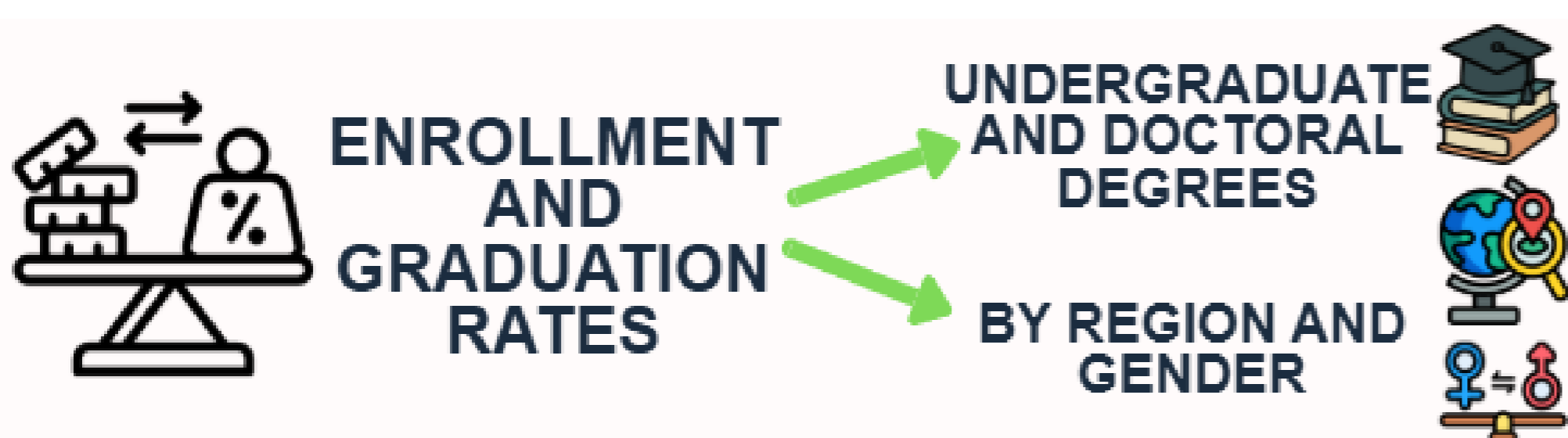
KEY QUESTION: ARE THERE ENOUGH ENGINEERS?



METHOD

Official data from the Spanish university system on enrollment and graduation rates in engineering are used, differentiating between undergraduate and doctoral degrees, and disaggregated by region and gender.

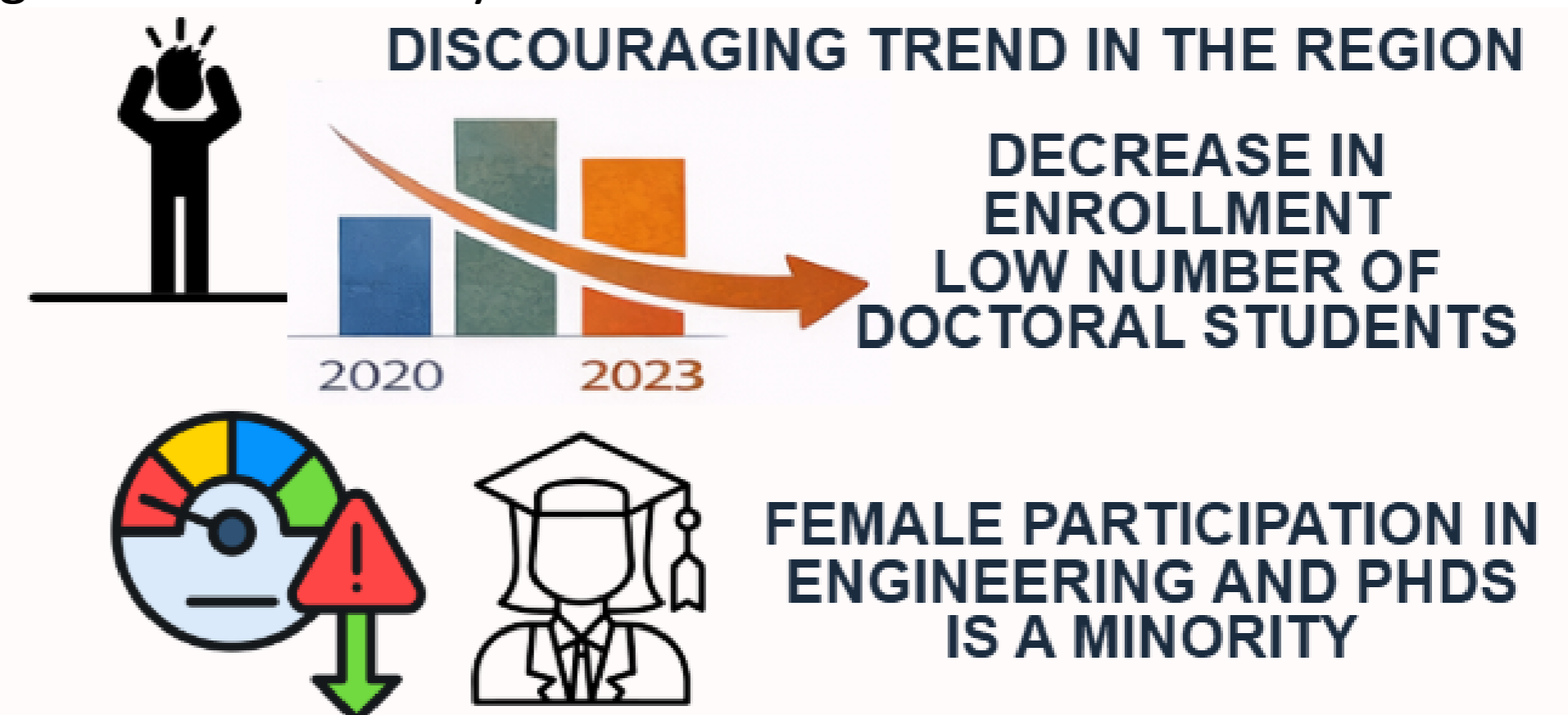
This dataset describes the trends, and models are applied to project the scenario up to 2030, looking for signs of growth, stagnation, or decline.



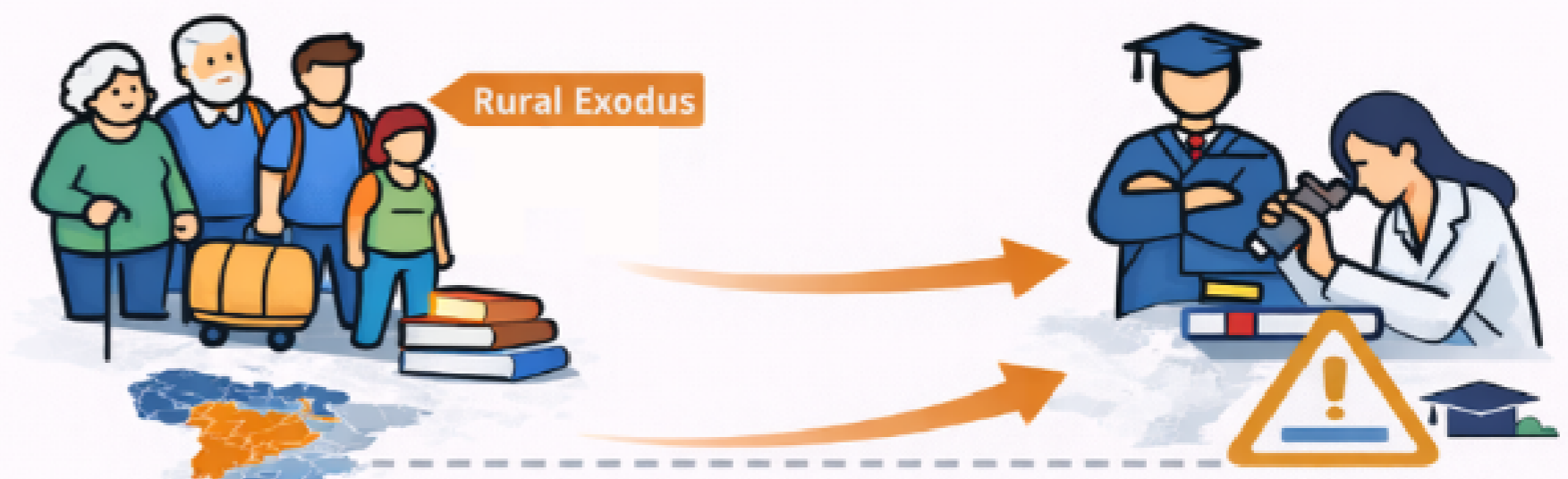
DATA FROM THE SPANISH UNIVERSITY SYSTEM

RESULTS & DISCUSSION

The data points to a worrying trend in the region: undergraduate engineering enrollment has been steadily declining and, in relative terms, is losing ground to other fields. At the same time, the number of doctoral students in engineering remains low compared to the national average, reinforcing the idea of an insufficient academic pool to feed the system in the medium term. The situation is no better in terms of gender: the presence of women in engineering continues to be clearly a minority, and although the percentage increases to nearly a third at the doctoral level, it still falls short of a balanced distribution. Taken together, these patterns appear to be related to demographic and territorial factors—such as age structure, student mobility, and the concentration of educational offerings—and point to an additional risk: with a limited critical mass, both faculty renewal and the capacity to sustain and scale regional research may be affected.



DEMOGRAPHIC AND TERRITORIAL FACTORS MAY LIMIT FACULTY RENEWAL AND REGIONAL RESEARCH CAPACITY



CONCLUSION

- Structural challenges for the future of engineering in sparsely populated areas of Spain.
- Decline in undergraduate enrollment and a reduction in doctoral students.
- Weakening of the education system and a loss of generational replacement.
- Gender gap.
- Difficulties in maintaining the flow of engineering graduates and researchers by 2030.

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