

Balancing Earth science careers in an unequal world

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The side event entitled "Early-Mid Career perspectives on South-North inequalities: Fair collaborative research as a way to reduce them", held during the 2nd Open Science Conference of the World Climate Research Programme (WCRP) and organised by the Young Earth System Scientists (YESS) community took place in October 2023 in Kigali, Rwanda. About 22 participants from different countries, both from the GS and the GN, attended.

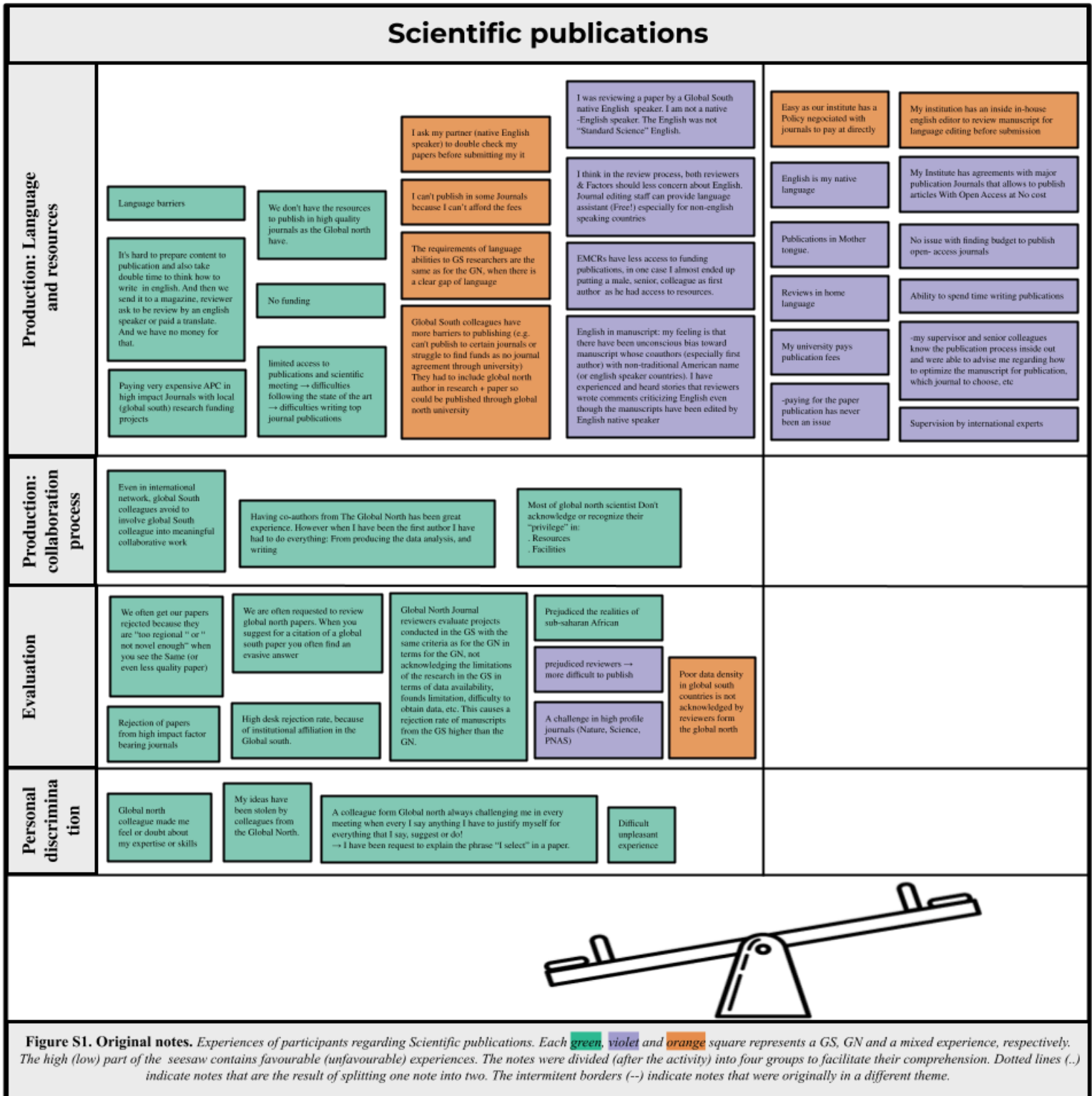
In the first part of the activity, **participants had to identify experiences** in which they had been involved in five main areas: **i) scientific publications; ii) participation in international organizations; iii) participation in conferences or courses; iv) access to quality jobs; v) access to resources and data.** The participants were asked to write down each of these experiences on a Post-it, **colour coded** to indicate **whether the experience was from the GS, from the GN, or a mixed experience** (not clearly from the North or South). The participants then put the sticky notes in the bag according to which of the topics they belonged to. Each paper was anonymous. Finally, the experiences were read out loud and **discussed to collectively decide where they belonged on a seesaw** (one per theme): either on the favourable (upper) or unfavourable (lower) part. In the second part of the activity, the participants worked in round tables and were asked to think about and **write down actions that could be undertaken** from individual to international scales **to bridge the gap between the GS-GN.**

The preparation of this paper was carried out once the activity was completed. First, we collected the anonymous sticky notes and digitized them. Secondly, we evaluated them eliminating

some notes due to lack of context or expression of wish. Also, we divided some notes in two when they addressed two different topics.

Find the original notes in Figures S1, S2, S3, S4 and S5.

Supplementary figures



Participation in international organizations

Working in international organizations

It's hard to try to said or discuss fluently in a no mother language

It's hard to try to said or discuss with seniors (Impostor Syndrome)

Colleagues from the Global South have difficulties in receiving their part of the project budget due to complications of the university system and inflexibility of North partners to find alternative methods to transfer the funds

Colleagues for Global North are kept/maintained in the system/position even if they underperformed for several years. If it were a Global South person, he/she would have been fired

Reaching international organizations

I don't think I'm able to participate given that I need time to publish papers and to analyze data. To participate in international organizations would take a lot of time, but I would really like to make a contribution

Inequality still remains in the participation of international organizations. But improvement is seen.

Very difficult if we don't have connections as most organizations are like a private club

ECR networks help to address these kinds of inequalities.

YESS has given me the opportunity to be involved in many international organizations.

Plenty of opportunities to have work

My supervisor is involved with several organizations and so was able to get me (and anyone in our group who expressed an interest) involved on a small scale

I have no experience on applying for board position but, I am involved in many project

ECR people from Global South get selected for international boards or committees easier than Global North

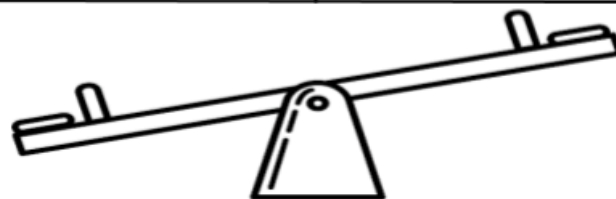


Figure S2. Original notes. Experiences of participants regarding Scientific publications. Each green, violet and orange square represents a GS, GN and a mixed experience, respectively. The high (low) part of the seesaw contains favourable (unfavourable) experiences. The notes were divided (after the activity) into four groups to facilitate their comprehension. Dotted lines (...) indicate notes that are the result of splitting one note into two. The intermittent borders (--) indicate notes that were originally in a different theme.

Participation/organization in conferences and training courses

Visas	<p>Global South colleagues miss events due to visas</p> <p>We had trouble hosting visitors from the GS because of visa issues. This harms our research as well, since we benefit from the exchange and knowledge</p>	<p>No need for a visa, or easy to get one</p> <p>I never had to pay for a visa to attend a scientist conference</p> <p>Never had to apply for a visa (apart from the 'on arrival' visas)</p>
Funding	<p>Being from the GS from my be a challenge to access to funding enough to cover participation abroad but funding support (from sponsors from conferences) is many times a solution</p> <p>I depend a lot on the funding from the organizations. Only when I was part of an international project I could afford the costs of participating in international conferences and workshops</p> <p>I exclusively depend on financial support from the conference to be able to attend. Even if I have my own funding project, the fund won't be enough</p> <p>Sharing a hotel room with a Brazilian colleague at a conference because my funding allowed for a double room and they had no funding</p>	<p>sometimes we are encouraged to apply for funding but, generally 1 international conference per year is possible without issue (sometimes more) as well as going to internationally recognised national conferences + meetings</p> <p>Access to funding for conferences</p> <p>I've been to 4 international conferences this year, fully funded, which I know is only possible with the resources of wealthy institutions</p> <p>there is a lot of financial support for attending conferences and training courses</p> <p>having funding to attend key meetings and training schools, networking + knowledge</p> <p>my institution provides a budget to attend the conferences</p> <p>PhD and postdoc account for conference travel in the budget-don't have to apply</p>
Opportunities	<p>No minorities opportunities</p> <p>This is my first international participation</p> <p>Discrimination</p> <p>We're used to working with nothing. And try to be McGiver of science. Try to resolver everything with what we have</p>	<p>ICTP training schools with scholarships for GS</p> <p>I head the right network to get the opportunity</p> <p>I make a lot use of free courses and have learn a lot from them</p> <p>I've been to several international conferences</p> <p>I believe I had chances for participation in conferences for being a GS researcher</p> <p>Not any issue</p> <p>Always supported to continue personal development</p>

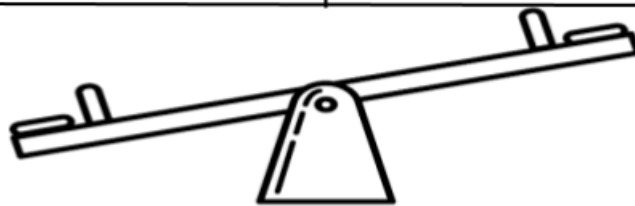


Figure S3. Original notes. Experiences of participants regarding Scientific publications. Each green, violet and orange square represents a GS, GN and a mixed experience, respectively. The high (low) part of the seesaw contains favourable (unfavourable) experiences. The notes were divided (after the activity) into four groups to facilitate their comprehension. Dotted lines (...) indicate notes that are the result of splitting one note into two. The intermittent borders (-) indicate notes that were originally in a different theme.

Access to resources and data

Data availability and accessibility	<div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">Doing research on the global south can be often challenging because of the lack of data</div> <div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">Our region has many areas with sparse data. Then many methods tools are difficult to apply since they were though by global north that have much more observations</div> <div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">Met services not sharing data, cost need to be covered by sales</div> <div style="border: 1px dashed black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">We have access to data, what we don't have is internet connection to download the data</div>	<div style="border: 1px solid black; background-color: #ffe0b0; padding: 5px; margin-bottom: 10px;">Quite easy to access to data as it is well organized</div> <div style="border: 1px dashed black; background-color: #d0d0ff; padding: 5px; margin-bottom: 10px;">Access to data is facilitated by my institution</div> <div style="border: 1px dashed black; background-color: #d0d0ff; padding: 5px;">Can request access to data through university or can use research budget</div>
Resources	<div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">It is difficult to get technical support in my institution, so you spend a great amount of time dealing with this kind of things</div> <div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">Political situation in region led to the shutdown of internet within severely affected ability think and productivity</div> <div style="border: 1px solid black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">There are great limitations to access computing resources and software between south and north</div> <div style="border: 1px dashed black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">We don't have computational facilities to process the data, we don't even have storage capacity.</div> <div style="border: 1px dashed black; background-color: #e0ffe0; padding: 5px; margin-bottom: 5px;">Poor expensive internet</div>	<div style="border: 1px solid black; background-color: #ffe0b0; padding: 5px; margin-bottom: 10px;">Coming from the global north to do an internship in the global south, realizing that a lot of time is spent in dealing with missing or outdated infrastructure - rather than focusing on the main task</div> <div style="border: 1px solid black; background-color: #ffe0b0; padding: 5px; margin-bottom: 10px;">I acknowledge that there has been some efforts to bridge the gap between north-south but technology is still a big challenging. May be offering opportunities to HS scientists to spend some time abroad processing data and producing results that can then better analyze back home is an alternative</div> <div style="border: 1px solid black; background-color: #ffe0b0; padding: 5px; margin-bottom: 10px;">Unreliable electricity supply</div> <div style="border: 1px solid black; background-color: #d0d0ff; padding: 5px; margin-bottom: 10px;">Internet is extremely slow in Germany</div> <div style="border: 1px solid black; background-color: #d0d0ff; padding: 5px;">Funding is available but competitive. Need more resources for interdisciplinary research</div>

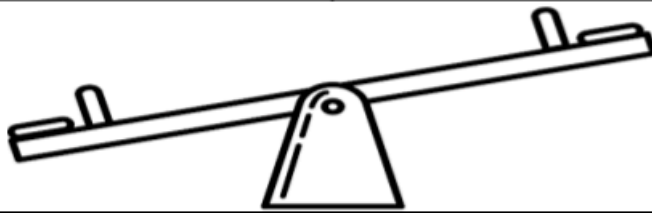


Figure S4. Original notes. Experiences of participants regarding Scientific publications. Each green, violet and orange square represents a GS, GN and a mixed experience, respectively. The high (low) part of the seesaw contains favourable (unfavourable) experiences. The notes were divided (after the activity) into four groups to facilitate their comprehension. Dotted lines (..) indicate notes that are the result of splitting one note into two. The intermittent borders (--) indicate notes that were originally in a different theme.

Access to quality jobs positions

Salary	<p>At postdoc level pay is generous, however, contracts are usually short term (< 1 year possible, lucky if you get 3 years) so the positions are precarious until you get to a professorship</p> <p>At the PhD level it is common to be paid, but only for half your time, which has been a challenge considering rising costs of living (housing, groceries), but it is manageable without needing extra funds.</p> <p>Global south academic colleagues have less time for research as they have to conduct consultancy work to bring income as their university doesn't cover 100% of their salary. Meanwhile Global North have salaries all covered.</p>	
Positions' availability and access	<p>In Argentina, permanent positions are not as difficult to get but the salary is not enough</p> <p>A big challenge in the north when you graduate in university from south</p> <p>Jobs for scientists are difficult, globally. I think the main issue is the language limits</p> <p>No jobs</p> <p>Quality is hard to define. Professorship/tenure is hard to obtain Work-life balance is actively considered</p> <p>In my institution, permanent positions are very difficult to get. So people go from postdoc to postdoc for several years before finding a permanent position</p> <p>We have to compete with people with more cv because they have more resource like money to paid for paper and we have to wait like 7 month to get something</p> <p>It's quite challenge to get a permanent position but not short term contract</p> <p>Colleagues in Global South move to Global North institutions as they can't pursue career in their home countries due to lack of jobs, budget access to resources</p> <p>I could not get hired at a position that was at my level of studies because of my origins. I guess it's because according to them, someone from the global south can't be at a top position.</p> <p>I'd like to see more opportunities to work as climate scientists outside academia in places such as NGO, governmental agencies etc. Sometimes it's hard to find jobs besides data scientists positions.</p>	<p>In Argentina we have the possibility to access to stable position (though not so good salaries) But that is something to be proud of since even in many global north countries EMCRs have to struggle to keep moving from one postdoc to another</p> <p>Can apply to multiple positions Aware that I will be jointly judged/evaluated</p> <p>Sufficient jobs in UK (still competitive) but more jobs come up. Don't have to worry about VISA.</p>

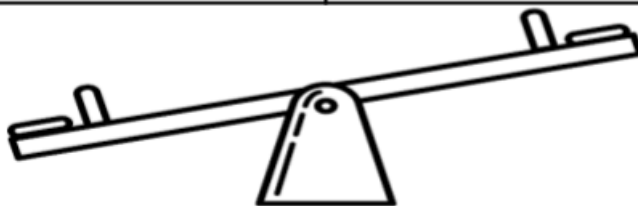


Figure S5. Original notes. Experiences of participants regarding Scientific publications. Each **green**, **violet** and **orange** square represents a GS, GN and a mixed experience, respectively. The high (low) part of the seesaw contains favourable (unfavourable) experiences. The notes were divided (after the activity) into four groups to facilitate their comprehension. Dotted lines (...) indicate notes that are the result of splitting one note into two. The intermittent borders (--) indicate notes that were originally in a different theme.