

# Defined by absence: Women and research in South Asia

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Analysing the issue in Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka

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# The missing women: In numbers

The rise in female higher education participation has been driven by rising incomes, the creation of a rapidly growing labour market for the higher skilled and gradually changing attitudes regarding women in the workforce. Higher education has become both more affordable and often a prerequisite to the region's competitive labour markets. However, female enrolment in postgraduate degree programmes has not risen as rapidly, and women as researchers are notably missing.

#### Women PhDs are many, but women researchers are few



According to an analysis of authors published in peer-reviewed journals in South Asian countries, between 12% and 32% of articles published in each country had a female author. And where they do publish, they publish more in arts and social sciences, and less in more science subjects such as mathematics and engineering.

#### Proportion of articles with female authors published in peer reviewed journals, 2012



EIU analysis based on data from Scopus (authors in peer-reviewed journals)

In India, almost half of postgraduate candidates are women, but few later take on a career in research. Women's age of marriage often clashes with PhD programmes, and women who have children during their postgraduate studies must interrupt their studies.



#### % of researchers who are female

	Source: UNESCO		
	India	Pakistan	Sri Lanka
2006/7	8.7%	8.7%	32.0%
2010/11	14.3%	23.6%	39.3%

#### **Proportion of South Asian women researchers to men by subject**

29%	27%	25%	25%	22%	
Arts and humanities	Biochemistry, genetics and molecular biology	Social science	Health professions	Business management and accounting	
18%	17%	16%	16%	15%	
Physics and astronomy	Mathematics	Earth and planetary sciences	Energy	Engineering	
			EIU analysis based on data from Scopus (authors in peer-reviewed journals)		



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# Summary

There is a closing of the gender gap in many parts of the world in terms of female access to education and enrolments at various levels of secondary and tertiary level. The World Economic Forum recently found that 105 countries had become more gender equal since 2005<sup>1</sup>, although female representation in the global workforce is still very poor. Indeed, in South Asia, the numbers of women in the workforce are in decline.

As a result, there are critical roles—such as research positions—in which women are disappearing altogether. Yet it is widely acknowledged that the role women play as researchers is critical to the quality of the research outcome. This fact is underlined by the push by governments and large research bodies to address this gender imbalance as a matter of urgency.

This new research report examines the barriers that women researchers face in South Asia, and recommends action to address them. Based on a series of interviews conducted with global experts in 2014, it shows that in South Asia, cultural restrictions and a lack of career opportunities play a major role in contributing to the gradual drop off of women researchers after Phd level.

There is a serious lack of gender specific data on South Asia that can help evaluate the gap in the workplace. Good initiatives are in short supply, and in cases where they do exist sustainable funding can be a problem. Our report suggests that this gender imbalance is not being taken seriously enough at the highest levels or by the women themselves.



## More women, better research

There are not enough women taking up careers in research in South Asia, and inequalities in the hiring process, unfavourable workplace practices and other institutional barriers may be to blame.

Yet gender equality is increasingly being required of large-scale research bodies in developing countries: the more women in research labs, the better the quality of science and knowledge production.<sup>2</sup> Elizabeth Pollitzer, director of Portia, an organisation devoted to improving gender equality in science, technology, engineering and mathematics (STEM) jobs, put it this way: "The collective intelligence of [a] team goes up as the team reaches gender balance. This is the argument that has persuaded the scientific community and the European Commission to take the issue of gender equality more seriously." Horizon 2020, the EU framework<sup>3</sup> for innovation and research, is designed to ensure a gender balance in all research decision-making.

#### Female education on the rise

The last four decades have witnessed a boom in higher education enrolment globally. Student numbers increased from 32.6 m in 1970 to 182.2 m in 2011, with a 46% increase in the East and South Asia region.<sup>4</sup> In India, the number of women in education has increased from 4.9% in 2005 to 7.2% in 2010 and 8.7% in 2012. Women make up 42% of college graduates<sup>5</sup>, accounting for 80%<sup>6</sup> of the students enrolled in the biology and health sciences fields, but only 35% of students enrolled in engineering and physics degrees.

In countries such as Nepal and Sri Lanka, enrolments in degree programmes have increased 10 times over the past four decades.<sup>7</sup> In Bangladesh, the number of girls passing the secondary school certificate has risen significantly in the last decade, with student enrolments in higher education doubling over the last decade to around 2 m. Here, more than 800,000 students are female<sup>8</sup>. Even in Afghanistan, where women's access to education is restricted, total student participation in higher education grew more than threefold from 2002 to 2012, to around 150,000 students.

## Gaps in workforce participation

At the same time, women are massively underrepresented in the global workforce. There are 865m women worldwide<sup>9</sup> who have the potential to contribute more fully to their national economies, 812m of them in emerging and developing nations. But in South Asia, female labour force participation has been steadily declining since 2005. India, for example, has one of the lowest rates of female labour participation in the world at 35%.<sup>10</sup> Female employment in India grew by 9 m<sup>11</sup> between 1994 and 2010, but could have increased by almost double that figure if women had had equal access to employment.

Countries in the region are still shackled by conservative views of women's roles in society: there is still little promotion of possibilities outside the traditional role of home carer, although interviewees

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<sup>1</sup> BBC, 'Sweeping Change Narrows Gender Gap', 2014.

<sup>2</sup> *The Telegraph*, 'Scientists Take Note: Women Are the Key to the Best Results', 2012.

<sup>3</sup> Horizon 2020, 'Promoting Gender Equality in Innovation and Research'.

<sup>4</sup> UNESCO Institute of Statistics, 'Expanding Out, Expanding Up: The Rise of Graduate Education and University Research', 2014

<sup>5</sup> Bloomberg Businessweek, 'Keeping Women on the Job in India', 2011

<sup>6</sup> SciDevNet, 'More Women Find Success in Science', 2014

<sup>7</sup> UNESCO Institute of Statistics, 'Expanding Out, Expanding Up: The Rise of Graduate Education and University Research', 2014

<sup>8</sup> *The Daily Star*, 'Social Hurdles Stand in Women's Way', 2014

<sup>9</sup> IMF, 'Women, Work and the Economy', 2013

<sup>10</sup> McKinsey, 'Women Matter—An Asian Perspective: Harnessing Female Talent to Raise Corporate Performance'

<sup>11</sup> International Labour Organization, 'Why is India's Labour Workforce Participation Dropping?', 2013



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for this report acknowledged that this was slowly changing. Research from Bhutan, for example, shows that while some women showed an interest in joining politics, they also felt that domestic duties prevented them from taking a more active role in public life.<sup>12</sup> In Bangladesh, the employment rate of women is nearly 30% lower than the rate for men.

# The mystery of the missing female researcher

When it comes to women and research these gaps in participation prove even more formidable, despite a higher number of women working as researchers in the fields of social sciences, the arts and humanities. The STEM sector has always involved a large gender disparity. Despite positive action, there are still acute imbalances in both developed and developing economies.

A 2012 European Commission study found that although around 42% of UK academic staff are women, only 17% reach the most senior research grade, below the EU average. Women also fare poorly when it comes to the awarding of research grants.<sup>13</sup> In the US, women make up only 21% of science professors and just 5% of engineering professors.

In South Asia, the problem is even more acute. The number of female researchers varies across the region, from 8% in Nepal to 37% in Sri Lanka.<sup>14</sup> In Sri Lanka, a higher<sup>15</sup> proportion of women researchers can be found in 'softer sciences', but far fewer in the engineering and technology sectors



Share of enrolment, % Women Men 70 70 60 60 50 50 40 40 30 30 20 20 10 10 0 Bachelor's programmes Doctoral programmes Master's programmes

Notes: Data cover 97% of higher education enrolment in the 26 countries or territories analysed in this report. The percentage is a weighted average. Surce: UNESCO Institute for Statistics, October 2013

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<sup>12</sup> LiveMint, 'Bhutan FacesUnofficial Gender Gap',2013

<sup>13</sup> The Royal Society: In Verba blog, 'Gender Balance Among University Research Fellows, 2014

<sup>14</sup> Groundviews, 'Where Are All the Sri Lankan Female Scientists: A Case of Democratising Science', 2014

<sup>15</sup> Ibid.



(only 27%) and social sciences (only 30%). In India, the percentage of women in research and science and engineering roles is just 15%.

It seems that the higher up the ladder you go in South Asia, the less visible women become. Only 3% of vice-chancellors in India are women, for example, with six of the 13 female vice chancellors found at women-only institutions. Some attribute this trend to the expectations placed on women in South Asian societies. "The average expectation in India was that you would first take care of being a young woman who has to settle and have a family. And then, if time permits—everything else permits—you will continue research," says Rohini Godbole, Professor, Centre for High Energy Physics, Indian Institute of Science, Bangalore.

Afghanistan	Bangladesh	India	Pakistan	Nepal	Sri Lanka
12%	15%	23%	19%	21%	32%

## A gradual drop-off

In India, most potential women researchers are lost after undergraduate level, with fewer women taking up post-graduate studies. The representation of women falls from 40% to 25–30% at post-graduate level.<sup>16</sup> This is a trend which permeates national boundaries. In China and Japan, studies have shown that the ratio of men and women in research is roughly equal until the end of schooling (46% and 51% respectively), with the gender gap widening after undergraduate degree level and further still for those taking up research as a career (25% and 14% respectively).

According to data collected by Scopus, the largest abstract and citation database of peer-reviewed literature, there were 175,282 authors based in Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka who published in peer-reviewed journals in 2012. While Scopus does not collect data on gender, the Economist Intelligence Unit conducted some analysis to find approximately 20% of authors were female researchers<sup>17</sup>.

## Barriers, but no pathway

These persistent inequalities require explanation. The reasons are complex and varied and differ from country to country, but in many cases they are caused by institutional bias and a deeply embedded set of behaviours.

Interviewees for this report cited many institutional factors which worked against South Asian women: the male-dominated committees, boards and networks that can influence a woman's future; a lack of transparency around decision making regarding promotions, research funding and job postings within faculties; and a lack of enthusiasm on their own behalf to pursue research as a career (possibly for the reasons cited).

<sup>16</sup> Rohini Godbole, 'Engaging Women in Science in South Asia: the Indian Story', 2012

<sup>17</sup> Note on methodology: The Economist Intelligence Unit's research team identified common male and female names to group author names by gender. Where names were common for both male and females we tried to locate other online information that would help in identifying individuals. Findings are approximate.

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In 2004, an Indian National Science Academy (INSA) report<sup>18</sup> found the most common problems keeping women from advancing were gender-insensitive organisational practices, gender-related discrimination, nepotism and sexual harassment.

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Interviewees also said that many young women 'denied' themselves career options, which had adversely affected their careers. In part, this was because they did not take research—and its challenges—seriously as a pathway to more senior positions, and instead opted to take up more 'family-friendly' roles in teaching. The number of female teachers in India has steadily increased from 43.46% in 2008–09 to 44.83% in 2009–10 and 45.51% in 2010–11.<sup>19</sup>

Some believe there is a lack of awareness among female researchers of the crucial links between publishing and becoming 'visible'. "Only when you have published your own research do you become *visible* as a woman. And unless you're visible, you don't take the next crucial step to senior management positions, which have all the authority and power. So in that sense it is linked, and many women are not even able to see these linkages," said Rekha Pande, professor and head, Department of History, University of Hyderabad, India.

Research has also tied female parity in STEM fields to factors such as higher economic status and a supportive policy environment. An Indian Government–commissioned report<sup>20</sup> found supportive facilities were needed to narrow the gender gap. These include crèches, day care centres for the elderly, flexible working hours, part-time jobs and campus housing.

## Lack of mobility

In today's globalised world, mobility has become an important factor in career advancement as many research positions, whether in science, social sciences, the arts and communication, involve long hours of work and, in many cases, domestic or overseas collaborations. For South Asian women in their twenties or thirties, moving away from home may simply not be an option.

"Often, post-doctorate work is overseas and can involve more than one institution. So if you can't relocate for a variety of reasons it makes it very difficult," commented Tanya Fitzgerald, Associate Dean (research), Faculty of Education, La Trobe University. Rekha Pande agreed, saying: "Many women are not comfortable going out, travelling around doing field work, collecting data, so there is a problem with moving to different areas."

## **Networks and recognition**

A high emphasis is placed on the role of networking to achieve recognition as a researcher. Yet here, too, women are heavily disadvantaged because of a lack of access to networks. Traditionally, joining social clubs, attending sporting events or bonding over a televised cricket match in the pub present an invaluable relationship-building opportunity for male researchers. But women—whether in South Asia, Australia or the UK—are often simply not invited to join in these activities. As a result, as one interviewee told us, the 'rules of the game' remain an unknown.

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<sup>18</sup> Indian National Science Academy, 'Science Career for Indian Women', 2004

<sup>19</sup> Times of India, '45% of Teachers in Indian Schools Are Women', 2012

<sup>20</sup> Indian National Science Academy, 'Science Career for Indian Women', 2004

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"We call it accumulative advantage and accumulative disadvantage. So once [researchers] get name and fame, they get more resources, they get more recognition, but those who are not part of the group, the social networks, they don't get ahead. Even the funding system, for example, they don't get enough funds," lamented Naleem Kumar, scientist, National Institute of Science, Technology and Development Studies (NISTADS), New Delhi

All our interviewees said recognition and acknowledgement from peers helped move careers along. "It's about being known. I found it difficult putting myself forward for external funding and competitive funding, and it wasn't that the project wasn't a good project, it was who's going to be reading your application and do they know you not necessarily know of your work, but do they *know* you? Establishing those networks became really important because these are the potential readers of your work," Ms Fitzgerald said.

#### **Disaggregated data**

A lack of data presents another problem. Scholars say that extensive and reliable gender data on the number of women PhDs in science, social sciences and arts is critical to retaining women in the workforce. In the UK, such data has been used to evaluate the drop-off rates among certain research fields and has enabled the promotion of action plans.

Yet not all countries use gender disaggregated data, which makes it much harder to track the number of women in science roles.

"If you were to ask me for the percentage of female professors in India, I would be able to tell you based on my own study, there is no government data, or [any data from] the University Grants Commission. The data doesn't exist, or whatever there is it is not updated," said Ms Kumar.

## **Rise of positive action**

Yet despite these challenges, there are signs that the needle of progress is moving forward. The issue of gender balances in conducting research is now a core component of the EU's framework for innovation and research and the agenda has been championed from the very highest levels of government in South Asia.

The India Government has a National Taskforce addressing Women in Science under the Department of Science and Technology, an initiative that has been running for 10 years with a mandate to recommend appropriate programmes to address the gender imbalances in science and encourage women researchers to resume their careers.

The Women Scientists Scheme, for example, addresses the barriers Indian women face in returning to work after a career break by offering them a launching pad to resume their careers. The programme, which is open to women aged 30–50 who have reached PhD level, provides research funding and flexible work options, meaning the work isn't disrupted by moving to another part of the country.

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The University Grants Commission also runs Sensitisation Awareness Motivation (SAM) workshops to build the 'capacity' of women managers in higher education in India, with a focus on researchers. Although the programme has had funding problems, it has created more than 5,000 women managers and a valuable network of women scholars across the country.

A 2004 project by the Indian Academy of Sciences released a collection of essays—called *Lilivati's Daughters: The Women Scientists of India*<sup>21</sup>—to address the under-representation of women in the field of science. It included biographies of 100 Indian women in science detailing their inspirations, how their careers progressed, how they balanced work and family life, their experiences of workplace biases and the importance of mentorship.

## **Recommendations: Looking to the future**

The reasons for the lack of women in research are complex but not enigmatic; the evidence points to the need for the dissolution of stereotypes and prejudice, policies to address the prospects for women in academic institutions, and flexible work arrangements.

There has been progress in the cause of gender equity among researchers in social sciences and the broader STEM community, but there was still a long way to go and there are many ways to improve the status quo. One important step is adopting changes in work practices and support mechanisms designed to allow women to commit to a career in research beyond PhD level. That could go some way to addressing the 'leaking pipe' problem, although the process of gender equality takes time. "At some point in time a woman has had to leave science because of her family responsibilities and it is currently not possible for them to come back. That is the problem," said Ms Pande.

Leadership is needed to push institutions to act and in many cases there are not enough strong voices at the highest level. The intervention of the UK Department of Health's Chief Medical Officer, Dame Sally Davies, is a good example of how important this is to advancement. She linked research funding to progress on gender equality and this is viewed as something of a watershed for gender equality in research. It sparked real action and created results. "That intervention forced all medical schools to apply for the Athena SWAN Charter and, as a result, their application numbers have tripled," said Ms Pollitzer. From this year, medical schools in the UK no longer get shortlisted for research funding unless they have a silver award from the Equality Challenge Unit's Athena SWAN Charter for Women in Science, which promotes gender equity in research. Institutions which have for a long time maintained gender imbalances in the workplace are now being forced to change.

Indian gender scholars highlighted the need for strong mentorship throughout all levels of education and the promotion of women who have carved out successful careers as researchers. More needs to be done to draw back the curtain on the work and lives of researchers to show just how essential their work is to society. In the media, there is scant attention played to this, but more and more stories are being heard about the transformative work of women in diverse fields of study.

<sup>21</sup> Badalja, 'What It's Like to be a Woman Scientist in India', 2014

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Success demands that women represent an increasing proportion of the academic talent pool, particularly among the dwindling number of researchers. The World Economic Forum recently forecast that it would take 81 years to achieve gender parity in the workplace. Gender scholars are hopeful that the gap will be closed long before then.

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