

DST WOS-A: the scenario from recipient's perspective

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The scientific community of India is more or less familiar with different research project schemes of DST, some of which are open to the researchers without any permanent position. One such scheme titled 'Women Scientist Project' (WOS-A) is open to women candidates only, for carrying out research work at different levels. In the website of DST this scheme is included in the list of important scientific programmes, the preamble of which seems to be very thoughtful and admirable¹. The scheme promises to offer research opportunities to committed women scientists with career breaks and help them re-enter mainstream Indian science. Generally, at the age of 25–35 years female researchers with brilliant academic records and research skills, are burdened with family duties and are often forced to take career-breaks (sometimes for several years) which is reflected in the downturn of their hitherto successful career. Women with such breaks during/before doctoral research are helped by an 'internship programme' (to pursue Ph D) and women with doctoral degree are funded to execute independent research proposals under the 'project mode' of the WOS-A scheme, the issues related to which will be addressed here. Therefore, unlike any standard research fellowship/research associateship (RA) programme, the project mode of WOS-A is based on the ability of a trained scientist to run a research project independently. Thus the WOS-A scheme tries to tap the potential of the highly trained women scientists who are left out from Indian science space due to family reasons. Considering the fact that only 15–20% of women who get their doctoral degrees, pursue their career in science², the scheme must be recognized as well-intentioned and truly helpful for women scientists having a mid-career-break.

The scheme was introduced in 2003 and over these years numerous proposals from the women scientists have been regularly defended, granted, executed and finally evaluated (graded) by a DST appointed Project Advisory Committee (PAC). It is therefore expected that over these years this scheme has supported an appreciable number of women to return

to mainstream scientific research. Strangely enough, the extent to which the present scheme has been successful in supporting the career revival of women scientists is yet to be clearly evaluated. At the same time the feedback from the recipient's side were neither collected nor invited.

The outcome of WOS-A scheme, the number of projects submitted and their evaluation report in different academic years are available online in the Annual Reports of DST from 2009 (ref. 3). An analysis of the available data shows that the number of projects supported under this scheme has fallen steadily from 2009, with a slight increase during 2013 and 2014, which reflects a gradual fund-crunch in this scheme (Table 1). The evaluation of the projects every year had shown that 8.9%, 6.1%, 14.2%, 5.7% of the projects were rated 'very-good/excellent' by DST appointed PAC during 2010, 2011, 2012 and 2013. However, a close inspection of the reports also reveals that during the successive years 2009, 2010 and 2011 it was stated that 'approximately 30% of the awardees have got employment in universities and national labs – a significant addition to the scientific workforce of the country' though the claim of employment was not backed by data. On the contrary, from 2012 to 2016 it is stated 'approximately 40% women scientist achieved Ph D degree with the help of WOS-A project which show the relevance and popularity of the scheme'. It is difficult to understand whether there is a conscious change in focus of the scheme from nurturing women scientists to re-enter mainstream research to a simple fellowship

programme for doctoral degree. In fact our observation is, at present, more funding is available for pursuing doctoral research (internship mode) and only a handful of projects are funded to women scientists in project mode, though such detailed data is not available from the DST. While it is essential for DST to ensure enough fellowship programmes for female doctoral scholars with break in careers, this also indicates that the original 're-entry' problem is no longer addressed.

The problems regarding 're-entry' of women have been elaborately discussed by Godbole *et al.*² who has compared the system with a 'leaky' pipe. In 2006, Kurup *et al.*⁴ pointed towards the need for modification of existing structure to ensure the re-entry of women in the arena of science; but no amendments were made thereafter. As the recipients of research grant under project mode of this scheme, we feel that if it truly wants to bring back the trained women workforce into mainstream of science, it needs modification in execution and above all a change in attitude. Based on our experience, we offer a detailed feedback and highlight the limitations of this scheme, which may help to improve the effectiveness of the programme. Some of the inherent problems/self-contradictions in the scheme and our suggestions corresponding to the problems are also given, which are expected to make the science policymakers aware of the objectives of this scheme.

1. Apparently, the WOS-A projects are approved absolutely on the basis of the merit of the proposal, which is elaborated during the submission of the

Table 1. The funding scenario in WOS scheme (Source: Annual Reports of DST)

| Year | Projects submitted (No.) | Projects funded (no.) | Success (%) |
|--------------------|--------------------------|-----------------------|-------------|
| 2003–2006 (ref. 2) | 3160 | 399 | 12.6 |
| 2007–2009* | – | – | – |
| 2010–2011 | 553 | 191 | 34.5 |
| 2011–2012 | 995 | 252 | 25.3 |
| 2012–2013 | 1108 | 214 | 19.3 |
| 2013–2014 | 1037 | 222 | 21.4 |
| 2014–2015 | 1092 | 280 | 25.6 |
| 2015–2016 | 729 | 139 | 19.1 |

*Data unavailable in public domain for 2007–2009.

project and defended during the project presentation meeting. But the biggest problem of this scheme like any other reservation scheme is, that it is looked down by the larger part of the society (including some of the coordinators) who consider it as a 'dole' and this mindset is reflected in its half-hearted management of the scheme^{4,5}. The prolonged process of project approval that WOS-A candidate faces and irregular release of grants is the effect of such attitude. Unlike other DST projects, a WOS-A project takes more than one year to get approved (from the time of submission), followed by the grants several months later; this time lag has increased over the last few years, which actually adds to the career break and amplifies its effect on the career of the scientist.

Therefore, timely release of funds and proper evaluation at regular intervals must be ensured for smooth and efficient functioning of a WOS-A project. The host institute is not responsible for the lack of funds of a DST sponsored WOS-A project, thus the research work of the Principal Investigator (PI) is badly affected if funds are not released on time. Since the PI herself has the sole responsibility for the successful execution of the project, at the end of three years she has to bear the damages to her career. The situation can be partly saved by a process of regular monitoring to address her grievances. Other than only the project evaluation, the PAC members should also be empowered to look into the smooth execution of the projects.

2. In the structure of WOS-A scheme, a mentor from the host institute is required to ensure that necessary research infrastructure is available to her. DST does not encourage the WOS-A project to be executed in the same institute where the candidate has done her Ph D. It becomes difficult for the PI to find appropriate mentor in a new environment who treats her as a trained scientist in the group instead of a liability. There are several schemes of DST/DBT which support young scientists (Start-Up Research Grant for Young Scientists, SURGYS) without any mentor. This difference in execution often misguides people to consider the WOS as research associates of the mentor.

We feel that the role of mentor and the host institute must be clear and comprehensible. Otherwise the WOS are not treated as scientists and often institu-

tional infrastructure is not made available to her, in spite of the initial promises of the host institute which receives the project overhead charges. We also suggest institute/universities receiving government grants should bear the responsibility of hosting WOS as a gender initiative. It is also important to have a gender audit for institutional workforce at all levels, after regular intervals.

3. In our country employment in universities and research institutes requires a Ph D degree and related post-doctoral research experience. Therefore if the WOS candidates with career break can grab such opportunities during/after completion of the project then this scheme should be considered useful in bringing women back to the mainstream science. This can only happen if the WOS carrying out quality research work are identified and evaluated accordingly. In the present curriculum of WOS-A, proper evaluation and accreditation (of the women scientists as PIs) are missing; as a result, a successful implementation of WOS-A project (with limited infrastructure and no manpower) for three years counts nothing to the career of the PI other than a simple post doctoral experience (publication/patent, etc.). More explicitly, women scientists (above a certain age due to career-breaks), who have chosen to pursue research project instead of trying other job options (e.g. teaching in college or working in industries) and have been successful in doing so, are considered inferior compared to other candidates. They do not get any additional score for their experience as 'scientist' rather are disqualified for age, which is a self-contradiction of the system and consequently fails to bring trained woman workforce back into the mainstream. After successful completion of a project, the PI is neither endowed with a better project nor acquires the necessary qualification to apply for Assistant/Associate Professorship in research institutes/universities. For assistant professorship they are considered nothing better than an over-aged RA and are not qualified for associate professorship because research experience mentioned there stands for the experience of working under a specified salary scale. Thus WOS candidates are marginalized and can never compete with fresh candidates or even with them who are in permanent positions (in colleges or even in industries) but are not pursuing research.

Even during the application for a second WOS project, the PI is treated at par with a fresh applicant. If the WOS panel itself does not credit its successful PIs, how can they expect anything better from the larger scientific community?

In our opinion, proper categorization and evaluation of the project is the most important point that can make the scheme more successful. The term 'scientist' in the title of the scheme should be properly applied and it must refer only to the 'scientists' and not the research fellows stated above. Therefore at the first place the research fellowship scheme (internship mode) should be separated from the project mode so that the WOS are never misunderstood as fellows/associates. The submitted projects must be properly screened before approval so that ideas and skills of the WOS are never mistrusted. It is the general perception (or a deep rooted gender bias) of the system which often undermines scientific excellence and commitments of a woman (especially with a mid-career break), and puts hidden barriers to her activities as well as her progress as a scientist. This aspect must be taken care of so that the term 'women' does not get more importance than 'scientist'.

After proper evaluation, the projects must be appropriately graded and accredited so that the experience of a WOS (as a scientist) can be considered separately from research associates. This experience should be considered as an added qualification for the entry to mainstream science as an Assistant/Associate Professor. At this point we can refer the SRA/Scientist Pool Scheme of CSIR that offers a fellowship for three years under a specified scale; the WOS-A scheme and also other tenure track schemes like SURGYS should offer such benefits to its recipients. Otherwise the people who select research against different odds are not much benefited from these schemes. At the same time WOS acquiring a 'very good' or 'excellent' grades should be allowed to continue the research work (in the same or a new project) without a prolonged screening and defending process which in turn would help in the comeback of women scientists by reducing unproductive waiting times. The dedication of the women scientists who preferred to carry out research, instead of 'dropping out' has not been recognized for too long. We emphasize that, if the

scientifically trained women workforce missing in the parentheses of other jobs (including family duties) are to be brought back to the mainstream with the help of WOS-A scheme then immediate changes in the structure of the scheme is mandatory. Otherwise, as in the present condition, WOS candidates will eventually drop out of the scientific arena after completion of one/two projects.

Therefore, the difficulties faced by us during execution of WOS-A project have led us to write this article and we have

not only pointed out the problems/drawbacks of the scheme but also have suggested possible solutions. We think there is ample scope for improvement of the scheme so that it becomes really helpful not only to the women scientists but to the Indian science as a whole.

1. <http://www.dst.gov.in/scientific-programmes/>
2. Godbole, R. M. and Ramaswamy, R., Women in Science and Technology in Asia; http://www.ias.ac.in/public/Resources/Initiatives/Women_in_Science/AASSA_India.pdf

3. <http://www.dst.gov.in/about-us/annual-reports>
4. Kurup, A. and Maithreyi, R., *Curr. Sci.*, 2006, **100**, 43.
5. Subramaniam, J., *Feminists and Science* (eds Krishna, S. and Chadha, G.), STREE, Kolkata, 2015, vol. 1, p. 22.

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Seismic threat to the Chitwan and Hetauda Duns, Central Nepal

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Flat land (or plains) in a Himalayan country like Nepal is very significant. In general, such plains occur along the Himalayan front marked by the Siwalik hills (both as Indo-Gangetic plains to its south and intermontane valleys to its north); these areas also accommodate significant part of the total deformation in the Himalaya and are prone to large earthquakes as evidenced by past surface

ruptures¹. A large part of the plain area in Nepal is contributed by intermontane valleys (duns) developed within the Sub-Himalayan Siwalik belt (locally known as the Churia zone). The Chitwan Dun in Central Nepal represents one such intermontane valley developed to the SW of Kathmandu. With an area of about 1575 sq. km, the Chitwan Dun is the largest intermontane valley in Nepal (Figure

1). To its east lies another smaller intermontane valley called as Hetauda Dun with an area of ~150 sq. km. These duns comprise Nawalparasi, Chitwan, Parsa and Makwanpur districts with moderate population density (~260 persons per sq. km)². Some major townships of Central Nepal such as Ratnanagar, Bharatpur, Narayangarh and Hetauda are located in this valley. The Narayani and East Rapti Rivers flow through the Chitwan Dun thus supporting large scale human settlement and agricultural activity in the valley. The E-W/Mahendra Highway – an important connecting route between Kathmandu (northern Nepal) and the Indo-Gangetic plains of Nepal and India – passes through these duns. This highway is important for trade, commerce and tourism. The southern part of the Chitwan Dun is occupied by the Chitwan Wildlife Reserve (developed along the Frontal Churia Range) that is home to many species of plants and animals and is also an important tourist destination of Nepal. Large scale industrialization and agriculture are being promoted in this region over the last few decades. Thus, a good fraction of Nepal's economy depends on these intermontane valleys. Establishment of several educational institutions and medical colleges in the Chitwan Dun also makes this area important.

The Chitwan Dun is bounded to the south by the Frontal Churia (Siwalik) Range which is developed due to thrusting along the Main Frontal Thrust

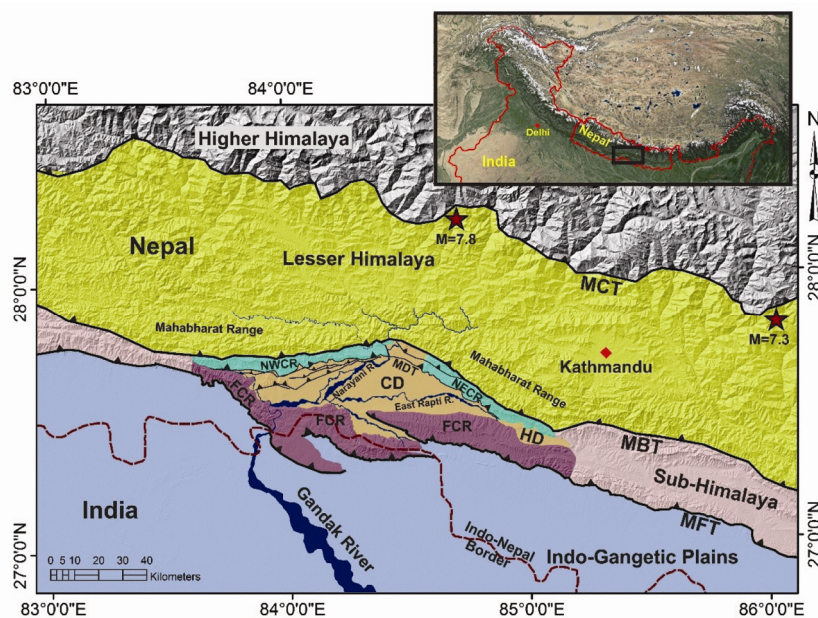


Figure 1. Map showing location of the Chitwan Dun (CD), Hetauda Dun (HD) and epicentres of 2015 major Gorkha earthquakes (marked with red star). Note the structures present within the Chitwan Dun (base map – hill shade Shuttle Radar Topographic Mission Digital Elevation Model). Inset: Location of the duns in regional context showed on Google Earth image.