

EXECUTIVE SUMMARY

Project Name: "Assessment of Government of India's Gender Mainstreaming Programs for Women in Science"

The presence of women in science spans the earliest times of the history of science wherein they have made significant contributions. Women scientists are being encouraged to pursue research in frontier areas of science and engineering, on problems of societal relevance and to take up S&T-based internship followed by self-employment. DST provides various schemes for women to continue their career due to any reason. WOS-A provides platform to women scientists and technologists for pursuing research in basic or applied sciences in frontier areas of science and engineering. WOS-B focuses on projects related to Science & Technology (S&T) interventions for societal benefit. WOS-C is being implemented by the Patent Facilitating Centre of Technology Information Forecasting & Assessment Council (TIFAC). The scheme aims to train women having qualifications in science/engineering/medicine or allied areas in the field of Intellectual Property Rights (IPRs) and their management for a period of one year. Bio-Care initiated a career enhancement programme i.e., Bio-Care to boost the involvement of women scientist in research field. UGC-PDF was launched by University Grants Commission to support unemployed women scientist holding doctorate degree in different subjects/ fields.

The objective of this present cross-sectional study is to evaluate the record of the women scientist who received any project in women empowering schemes i.e., WOS A, WOS B, WOS C, Bio Care or UGC PDF from 2003 to 2018 were enrolled, and to get detailed information, a questionnaire was prepared by the all regional and national PI and its feasibility was checked with selected women scientists and university professors. Questionnaire had both close ended as well as open ended questions. Pilot study was performed and the process of data generation was started. Data thus collected was subjected to statistical analysis to achieve objective of the study.

The present study is mainly based on responses collected from women in science. The respondent group consists of female belongs to various schemes under subcategory such as physical science, engineering & technology, mathematical foundation, life sciences, etc. The survey also covers both currently unemployed and employed women scientists undergoing a break in career, or family reasons, or maternity or financial problems and also dropouts from studies and research in science without any work experience. Four different questionnaires survey were prepared for the DST scheme mentioned above. The survey has been conducted in Haryana and Delhi covering premier institutes as well as proper data shared by DST. A Data-driven approach was adopted for the survey. Selection of respondents was purely made by data received from DST. Data has been collected through Emails, surveys, manual filling, social networking websites, etc.

A large number of projects from different women centric schemes were sanctioned from year 2003 till date, so it is impossible for funding agency to measure and track the effect based on the data submitted by the beneficiaries at the end of funding support. In order to track individual's progress over period of time, the present metacentric study was undertaken. For determining the overall effectiveness of basic objective to professionally empower women, the whole country was divided in to thirteen zones under the supervision of a national coordinator. The present study encompasses the north zone representing Haryana and Delhi regions. For any research first step is to define the geographical area where the possible research problem is to be explored.

For this an online questionnaire survey is prepared and distributed among women scientist belongs to Haryana and Delhi region. Based on data collection an analysis is performed on some parameters such as break in career, no of projects sanctioned, no of grant released, supervisor opinion, rating of various DST scheme, overall experience and rating of DST schemes, etc. Although we face many problems which are listed below but project is successful completed with great learning.

The primary data is collected from DST through emails, which helps us in finding appropriate women scientists but we are unable to find missing data although we searched through web-portals such as LinkedIn, social

network sites, etc. Also we had contacted their current institution through HODs, Dean but little response. The secondary data in this study was collected from journals, books, census and governmental web portals and Wikipedia.

Many problems/challenges were faced by the regional PI and her team during data collection. Some women scientist who had completed their research projects long ago and their contact numbers were not available with either DST or their host institute. Some women scientist had not responded to the repeated e-mails. Email ids of some women scientist were not functioning.

Due to Farmer protest in Haryana, mobile as well as internet services have been suspended in parts of the state, so it is difficult to contact women scientist. Also due to in Citizenship act Delhi some services have been suspended. But still regional investigator and her team tried to approach women Scientist by snowball sampling method. Due to limited internet services, they are not able to fill the online form, so the forms are being filled through telephonic conversations.

Sudden lock down due to pandemic of Covid19, personal visit to various universities of the region under consideration was not possible, so repeated requests were sent to the women scientist to fill the online form, but some women scientist didn't agree to provide their details. Despite all these challenges we tried to extract maximum data from the Haryana and Delhi.

The Statistical analysis of present study revealed an increase in number of projects sanctioned to women scientist from 2003 to 2018 in Haryana and Delhi. Unpredictable with the findings of present study it is also observed a remarkable enhancement in the number of women enrolled in higher education i.e. from 32.3% to 47.9% in various institutes from 1990 to 2017. Most of the women beneficiaries had break in their career and family responsibility was the major reason for this break in all the three regions under consideration. A considerable proportion of women scientists were satisfied from their mentor's, host institutes and family support. Women scientist from Haryana and Delhi revealed little mobility for transferring projects from one statute to another. In Haryana a significant proportion of women scientist had enhanced their educational qualification from postgraduate to doctorate during their research project.

In the present study maximum number of women scientists belonged to life sciences. Very few women scientist from Punjab represented chemical sciences (4.48%), engineering (5.97), mathematical sciences (2.99%) and Engineering and technology development (2.99%) field of specialization. No woman scientist from Haryana and Delhi received any project in engineering and mathematical sciences.

Similarly, health food and nutrition as well as earth science were not very popular among women scientist. Findings of Goal (2007) highlighted the status of women in engineering, and also discussed the underlying determinants responsible for lack of interest among women towards engineering. After analyzing the MHRD data (1950-2001), he revealed that number of women enrolling in sciences has improved much more as compared to engineering.

Analysis of research publication part of women scientists is not very encouraging. It is clearly noticeable from the analysis that out of the total respondents a considerable percentage of the women scientist (35.82%) in Haryana and Delhi have not published even a single research paper from the projects awarded to them. A substantial proportion of women beneficiaries published one to two research papers only. This may be due to majority of women scientist have not developed any skill or attended any seminar or conference/ workshop to update their knowledge with emerging and advanced techniques as well as methods of their subject in all the three regions understudy.

The present study has both direct (academic impact, research impact, professional impact, and capacity building impact) as well as indirect impacts (societal status upliftment of the women in science) on the women beneficiaries. This study provided a holistic perspective of impact of women empowering projects on the women in science. These Gender Mainstreaming programmes helped women scientist to enhance their research

skills. The success stories of women scientist will encourage other women scholars and researchers to pursue their career in science

There are certain weaknesses at the data collection level, institutional level, scheme level and on the part of women beneficiaries, which were encountered while analyzing the topic. During data collection we were unable to track some of the beneficiaries of the schemes, as year wise projects awarded to the women scientist in the respective schemes are missing. In some cases, information regarding PI's name, contact information and research topic was not available. Only mentor's name was provided in the data received from DST. We tried to contact them through their mentors also, but most of them were not supportive.

These women centric schemes initiated by Department of Science and Technology are an attempt to dismantle gender imbalance in science and bring women scientist in the mainstream. Gathering program-specific information about problems faced by beneficiaries or their requirement and impact on their professional development in academia, research and professional settings was a challenging yet vital requirement for successful assessment of these schemes.

It is very important that women scientist is encouraged and helped to establish themselves as professionals. They need to be given opportunities to enhance their professional image through the institution of prizes and awards for their contributions. This will immensely contribute to creating awareness amongst employers, parents, teachers and schoolgirl themselves.

Certain modifications in rules need to be provided to women professionals to help them cope up with the dual responsibilities of the home & profession. Sanctioning of the leave up to one year and flexible working hours are some of the suggestions often made. These facilities are relevant to the child bearing and rearing period.

“Women in Science” believes in a global contribution by creating a platform where challenges and possible solutions are tackled in order to build capacity of its group members as well as of other women who would consider the Working Group as providing a role model for career success.