



Institute of Bioinformatics
and Computational Biology

ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMS FOR WOMEN IN SCIENCE

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ANDHRA PRADESH

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Assessment of Government of India's Gender Mainstreaming Programs for Women in Science

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[Southern Region- Andhra Pradesh]

Submitted by:

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National Science and Technology Management Information System (NSTMIS)

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Every care has been taken to provide the authenticated information. However, the onus of authenticity of data rests with the PI of the project.



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Preface:

Over a past few decades development of women has been the forefront of policy making by the Government of India. As known and seen majority of the female population have been facing drawbacks particularly in education and in their concerned professions. This report targets women who highly qualified professionals particularly contributing in science and technology. Women play a vital role in society particularly in productive activities, social activities etc. To be honest it becomes true for women in science as research is where one makes their unique contribution. Based on this fact, seminars, conferences etc were organized and still carried nationwide as well as internationally to support governments in their efforts for developing policies and programs by addressing the Gender Mainstreaming issues specially to retain more female scientists.

A project was launched by DST, GOI to assess gender mainstreaming programs for women in science. Institute of Bioinformatics and Computational Biology (IBCB) have been entrusted as the regional coordinator for Southern Region State Andhra Pradesh. This study is focused on identifying the issues and challenges faced by women in science as well as identify the impact of gender mainstreaming policy of GOI regarding the progress of women in science and research in Andhra Pradesh.

This report has endeavored to provide a detailed analysis of the situation about the entry and retention of women in science and research. Also gives a comprehensive view of current status of women in science, their experience and issues in research so far. The project has attempted to identify the break in their career and the reason behind along with the employment status from a sample of 200 women science professionals. On the other hand, the collected data base helps in showcasing the total number women engaged in science when enhanced to the National Database contributed from the state.

The purpose of this report on “**Assessment of Gender Mainstreaming Program for Women in Science**” to measure and trace the impact merely based on the data submitted by the individual Women Scientists or respective organizations at the end of the completion of the project and consecutive funding support by the Government. The proposer and national coordinator have specified a systematic methodology for assessment of the impact of various funding programs.

The method includes planning, data collection, and analysis, recommendation and submission phases. The planning phase included developing familiarity with various gender mainstreaming programs of DST that will be covered in the project. We are extremely grateful and extend our gratitude to IBCB for making it possible to conduct the project.

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Satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of people who made it possible, whose constant support and contribution crowned the efforts with success. It is a pleasant aspect that I now have the opportunity to extend my sincere thanks to all of them.

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Abstract

Researchers say that the number of women climbing the career ladder in science and research is disappointingly low. The main reason behind this is retaining and promoting of women in the influential positions which is drastically low. In short **No room at the top for women scientists**. Other factors include low pay and funding, work-family balance, lack of recognition, opportunities and awareness of various schemes etc. Closing the gender gap in science and research leads to the promotion of women at institutional and organizational level and it is essential to launch acts and policies to reduce the gender bias for women's progress and retention as well as encourage more girl students to opt education in science assuring standard working life. Fortunately Government of India has launched various schemes and policies for the development of women scientists. The objective of this study is to know the impact of Gender mainstreaming policy of GOI on improvement of women scientists in the state of Andhra Pradesh entrusted under the eye of Institute of Bioinformatics and Computational Biology (IBCB). Amidst the challenges and issues the team has successfully coordinated in conducting the survey and gathered the data of women scientists from corresponding institutions, universities and research centers of various zones of the state. Further the collected data is also incorporated with the National database to have a clear picture of total women scientists present in Andhra Pradesh. This study strives for supporting and empowering the women scientists as well as the government to promote new policies and schemes encouraging more number of women scientists to take part and contribute in science and research.

Keywords: Gender Mainstreaming, Women scientist schemes, Questionnaire design

Executive summary

Project Name: “Assessment of Gender Mainstreaming Program for Women in Science”

Objective: A project was launched by DST, GOI to assess gender mainstreaming programs for women in science. Institute of Bioinformatics and Computational Biology IBCB have been entrusted as the regional coordinator for Southern Region State Andhra Pradesh. This study aims to examine the role of gender as a variable in determining science careers in India. The initial segment analyzes the data regarding the enrolment of women into science and research in Indian context. Through a basic assessment it addresses how many of them made active participation in science research and education. The later part concentrates on issues and challenges faced by women as well as impact of gender mainstreaming policy of GOI regarding the progress of women in science and research in Andhra Pradesh.

Sampling Design: The proposer and national coordinator have specified a systematic methodology for assessment of the impact of various funding programs. The method includes planning, data collection, and analysis, recommendation and submission phases. The planning phase included developing familiarity with various gender mainstreaming programs of DST that will be covered in the project. The present study is mainly based on responses collected from women in science. The respondent group comprises of female science experts of various categories, positions and experience and aspiring female researchers.

The survey has been conducted across Andhra Pradesh covering premier institutes and autonomous departments under the affiliation of standard universities. A purposive sampling approach was adopted for the survey. Based on this sampling approach the respondents were chosen to guarantee adequate number of women in science representing from various appropriate zones and category of institutes. Participation is made voluntary based on institutional and individual consent. By conducting personal interview with a structured questionnaire the data is being gathered.

Institutions from the following categories have been covered: DST, DBT, CSIR, Central, State and Deemed Universities, IIT, IISC, IISER, NIT, IIIT, NITTTR, Other Central Institutes, ICAR, ICMR, ISI, DRDO, DAE and ISRO. Sample of 20 respondents per institute have been targeted initially; while final numbers covered vary depending on their presence, availability and willingness to participate in the survey.

Methodology: For the evaluation of the effect of dual role on performance and career fulfillment of women in science a questionnaire has been designed taking into consideration both objective and subjective parameters. The data collection includes socio-economic and demographic profile of women in science, educational qualifications, occupation and career track details, specifics of breaks in education and employment, work place academic and non-academic infrastructure and facilities, work environment and peer group interaction, and achievement indicators such as publications, projects completed, awards etc. The subjective parameters include career objective, professional accomplishment, career continuity and advancement for women scientists.

The survey initially was carried by the zone wise selection of states across India and then the list of respondents is gathered from categorized institutes who involved in DST or any government funded projects. To carry this survey an online form was finalized by the national coordinator in April 2019 which is to be filled by the women scientists. Some of the other practices included personal interviews with women scientists through phone calls, some by visiting institutes, conducting meetings, contacting heads of institutes etc, only some of the women scientists responded through it was possible to gather above 30% of data .This procedure couldn't be adopted because of

- a) Various professional and personal commitments the meetings have to be rescheduled several times and some have rejected after few scheduling.
- b) Some couldn't be traced at their contact details while some declined to participate.
- c) Even if some of them are willing to participate, could not participate as they are not approved by the institutional heads.
- d) Unwillingness to participate in the study is also a factor as observed.

Observations:

As expected, nearly 56% of WOS in Andhra Pradesh are successful in both scientific research and their family responsibilities to strengthening the society in Andhra Pradesh. Scientific research is not so dearer to SC&ST communities and occupied only 4% in participation of this programme.

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Chapter 1 INTRODUCTION

1.1 Overview

Within the framework of a democratic polity, our laws, development policies, Plans and programmes have aimed at women's advancement in different spheres. From the Fifth Five Year Plan (1974-78) onwards has been a marked shift in the approach to women's issues from welfare to development. In recent years, the empowerment of women has been recognized as the central issue in determining the status of women.

In the Indian context women have entered into all disciplines of science & technology. In 1975 we had only 800 woman engineers. Similarly, the number of woman Ph.D. holders in science in 1950 was approximately 80 but this number swelled to 3312 in 1993 and today this number is more than 6000. Within "science", there were areas that were considered suitable for women and others considered outside their realm of capability. Thus it has taken a struggle, for instance, for women to become scientist.

The highest representation of women is in education. Education, to a larger extent, is considered to be most apt subject for women as it is compatible with other responsibilities of women as mother and wife. This is followed by disciplines like arts and medicine. Lesser percent of women seem to opt for fields like engineering. In the field of science, and engineering however it is good to note that, the women's enrolment is on rise over the years. In recent years the issue of marginalizing women from scientific career is being seen with concern all over the world. In India the problem is twofold: 1) getting more women to study science and technology and 2) ensuring that those who study are able to pursue a career in science and technology.

Dual role, Entry and Retention of Women in Science and Research in India

Women still perform majority of the care giving role and juggling of work in the family. Gender is seen as a significant determinant of negative job spill-over because employed women are expected to carry out the responsibility for family services and still be able to smoothly handle 12 their work roles (Delgado and Canabal, 2006).

In the Indian context there have been several studies on the problems related to retention of trained scientific women power sponsored by INSA, IAS and NIAS (Kurup et al., 2010; DST,GOI, 2010; Chandra et al, 2008; Pooncha and Gopal, 2004). These studies conclude that the complexity of developing interventions to retain women in Science stems from the diversity in the characteristics of women scientists across the different sub-groups of women in Science. The differences also, perhaps, stem from the different priorities the groups have because even with several commonalities among demographic profiles of the women, differences on important aspects such as professional prospects vs. childcare or family responsibilities are seen.

Schemes Related to Women Scientists in Research and Science

The major eligibility criteria for recruitment of staff for short term research project (technical support, research support and administrative support) or permanent scientist / researcher /consultant positions for the various categories of government institutions may be classified under the following heads –

- Minimum required qualifications in terms degree held which increases with rank and duration of job contract.
- Work experience in terms of minimum required number of years (1-3, 5, 10) in related field and specific designation or in a specific type of organization, which again increases with rank. Some substitutability is allowed between years of work experience and academic qualification.
- Upper age limit (25/28/30/32/35/40/45 yrs) which again increases with rank or level of appointment and also with nature and duration of job contract. There are provisions for concession to age limit applicable often for SC, ST, OBC, retrenched government employees, departmental candidates, ex- servicemen, physically challenged and in some cases for women.
- Women specific maximum age relaxation of two to five years is specific to certain types of job categories or designations e.g. scientist and researcher positions such as JRF, SRF, Post-doc, RA, Visiting Scientist etc.
- Other women specific measures / schemes include maternity leave, child care leave, women specific research grants e.g. DST Women Scientist Schemes of 2 to 3 years duration (WOS-A and WOS-B for unemployed women scientists and unemployed women scientists below 55 years age); DBT Bio-care Research Grant Opportunity 3+2 years duration for Ph. D. (age limit 55

years) women scientists who are employed, or unemployed or desirous of coming back after a break.

Broadly speaking, existing schemes and measures specific to women in science address the issue of dual role of women scientists primarily in terms of relaxation of (i) upper age limit, (ii) special leave provisions and (iii) special research grants for women undergoing a career break.

1.2 Scope of the study

This study is designed to assess women scientists from Southern Region, Andhra Pradesh, under Government of India's gender mainstreaming program. It throws a light on gender gap in professional attainment in women scientists and to promote their entry and retention in science by analyzing the effectiveness of policies and practices already in place thereby recommending the best practices and policies based on the newly generated data.

1.3 Objective

The specific objective of the study are listed as follows

- To explore, document and measure the rate of 1) women scientists enrolling in research and 2) breaks in career and low career attainment among female scientists.
- To identify the factors related to dual role like family care, household work, marriage etc that is liable for career break and dropout among women scientists in research.
- To develop a Geo-Spatial database platform for women in science and contribute the clear information to the National database.
- Document the issues and challenges faced by women scientists in research based on their career and working organizations.
- To find out the gaps between the problems faced and probable solutions by working women.
- The report also features the policy implications to ensure continuation and strengthening of such best practices further.
- To promote self structures at institutional and societal level there by helping women scientists to avoid career break if they wish to.

1.4 Methodology

Information on women's enrolment at different levels of university education was obtained. Considering the objective of the study, the data gathered comprises of only female respondents who availed WOS-A, WOS-B, WOS-C, BioCare and UGC-PDF science scheme for their development in career through DST, DBT and UGC under the Government of India financial aid towards women empowerment.

The research is being carried out in the context of the entity and the data was gathered primarily through personal interviews and observations, and through questionnaire methods both by direct interviews, by phone calls and by e. mails.

This study includes survey of women scientists working in various institutions. The prominent aspect is to include the women scientists working in different institutions, depending upon which area of specialization, area of working, nature of duties, timings, challenges etc. Apart from the main objective to highlight the representation of women scientists in research and the reason behind the dropouts or break, this study was also able to the sensuality of the relation between relativity of science & women.

To collect the data the following methodology has been adopted:

Team Formed

Formed a team to do survey in Southern States (Andhra Pradesh) guided by mentor. The number of teams formed based on the total number of districts in the state. The team leader trained their teams for gathering the information fruitfully.

Questionnaire

The data collected through these questionnaires cover both objective observable parameters as well as a few subjective parameters related to perception and attitudes.

These parameters include:

- Personal Information
- Information on currently affiliated institution
- Pre-Project Condition of Women Scientist
- Projects Related Information
- Project wise information
- Information about Institution
- Mentor's information
- Status of the project
- Current job details
- Professional Development
- Skill development
- Programme feedback

Contact Over Phone/Mail/Fax/Speed Post/Social Sites

All possible means of contact will be used to collect the preliminary data from the listed women scientists and to track the respondents by inclusion of various categories of institutes that is identified from official websites of government.

Contact Respective Institutions and Universities

To get a sufficient representation for each zone practically all the institutes accessible on official government sites were invited to participate in the study with a solicitation to send list of female respondents from the institution ready to take part in the study.

Conducting Workshop Programs

Conducting workshops at reputed institutes of various categories from each zone followed by representative sample of respondents from each institute there by giving them platform to present their work individually.

Chapter 2 STUDY REGION

Assessment of Gender Mainstreaming Program for Women in Science sponsored by DST (GOI) has meant to encourage women in S&T. Institute of Bioinformatics and Computational Biology IBCB is entrusted to conduct the survey in Southern Region State, Andhra Pradesh. Primarily information regarding the state is gathered and updated. Further a team is formed for the collection of women scientists' data from the corresponding institutions, universities and research centers from Andhra Pradesh.

2.1 State Description

Andhra Pradesh- the Rice Bowl of India is one amongst the 29 states of India located on the south-eastern coast of the country covering an area of 160,205 km² (61,855 sq. mi) standing as 8th largest state in area. According to 2011 census of India, the state occupied tenth place in category of population with 49,386,799 inhabitants.

Andhra Pradesh echoes the aura of antiquity through every little aspect of it. The state is vibrant with historical monuments which may be considered as an embodiment of architectural wonder. It has various temples, mosques, palaces and is rich in arts, crafts, dance and literature. The stretches of beaches that are present in the state have expanded the attractiveness of Andhra Pradesh tremendously.

The state has three principle physiographic regions: the coastal plain toward the east, reaching out from the Bay of Bengal to the mountain ranges; the mountain ranges themselves, the Eastern Ghats, which form the western flank of the coastal plain; in the southwest, the plateau toward the west of the Ghats. The coastal plain, otherwise called the Andhra district, runs practically the whole length of the state and is watered by a few streams, moving from west to east through the slopes into the straight. The deltas framed by the most significant of those streams—the Godavari and the Krishna—make up the focal piece of the fields, a territory of rich alluvial soil.

Almost 33% of the population lives in urban regions. Of the urban occupants, about half live in the state's 10 most-crowded metropolitan zones, prominently the industrial and manufacturing areas around Visakhapatnam and Vijayawada in the upper east. Other huge urban areas in Andhra Pradesh are Guntur, Kurnool, and Rajahmundry.

2.2 Economy:

Agriculture, dominated by the production of food grains, is a major, although declining, sector of the state's economy, in terms of value. Andhra Pradesh is one of the main rice-growing states in the country and is a significant producer of India's tobacco. The state's streams—especially the Godavari and the Krishna, yet in addition the Penneru—represent its agricultural significance. Livestock raising contributes roughly half as much in overall value as crop production. Since the mid-twentieth century has become the most exceptionally industrialized states in India. Industry—including mining, utilities, and development along with manufacturing—contributes same value to the state economy as does farming, despite the fact that manufacturing itself represents only a small proportion of the overall income.

The service sector is the biggest part of Andhra Pradesh's economy, representing the greater part of its worth. Banking and insurance, communications, and public administration are the three significant parts, with various services (includes tourism) comprising the rest of the value.

Courtesy from <https://www.britannica.com/place/Andhra-Pradesh/People>

2.3 Literacy

The state's educational system [2] accommodates 10 years of schooling followed by a two-year junior college course and undergrad and postgraduate training. In the mid 21st century the literacy rate surpasses 66% of the population, although male education is higher than female.

Since the late twentieth century, technical education has got extraordinary consideration to meet the needs of industrialization. Different industrial-training institutes offer professional preparing, while the engineering colleges of the affiliated universities train advanced and trending technical work. Scholarships are accessible for Scheduled Castes, Scheduled Tribes, and other hindered bunches in all instructive establishments that get considerable monetary help from state and government offices. According to the Census 2011 the literacy rate of Andhra Pradesh has been recorded as 67.66% out the males occupy 75.56% and females 59.54% mapping a decadal progress in literacy from 2001- 2011. There is a sizeable decrease in illiteracy in the state recorded as 4.87%. But there is a gap in female literacy rate comparatively to male literacy rate.

Courtesy from https://censusindia.gov.in/2011-prov-results/data_files/india/

Andhra Pradesh's literacy rate goes up but gender divides a concern

The National family health survey (NFHS-5) has discovered improvement in literacy in Andhra Pradesh. As per the survey the literacy rate among males (age 15-49) remained at above 80%, while it is 69% among the female population. AP ranks fifth in human capital, the category that focuses on quality of education and research capability. Literacy level is a crucial development indicator for improving awareness and to produce skilled workforce. It also promotes gender equality, health awareness and community well being apart from offering a wide range of social and economical benefits.

2.4 Status of STEM in state

Truth is education promotes development and improvement, and female education is viewed as a vital instrument in women empowerment and higher social development. Particularly the developing South Asian countries are most poverty stricken countries in the world. These countries are lagging behind in general and female literacy rates. According to the UNDP 2015 data, it indicates that higher literacy states show low poverty ratios in these countries. India which is the largest democratic country, second in terms of population and third in terms of economy in the world shows moderate level in literacy.

“India tops the world in producing female graduates in STEM but ranks 19th in employing them.”

As indicated by the United Nations, women constitute only 14% of the complete 280,000 researchers, designers and technologists in research development institutions in India. It seems like neither the graduates or the country is gaining much from STEM though more than 40% of Indians graduates in science, technology, engineering and maths (STEM) are women.

Indian Census of 2011 enrolled 74.80 percent of the 7 + age group population as literate, which was 65.40 percent a decade earlier in 2001 [3]. A wide gap greater than 20% focuses between the male education rates (75.65 %) and that of female literacy rates (54.16 %) were seen in 2001 evaluation, which has been diminished to 16 percent focuses among the male education rates (82.14 %) and female education rates (65.46 %) in 2011 This example of wide gap among male and female literacy is model of all societies having a strong male predominance base where advancement of the females is viewed as a more unpretentious list of social change. States like Odisha, Chhattisgarh, Andhra Pradesh, Madhya Pradesh, Arunachal Pradesh, Jammu and Kashmir, Uttar Pradesh, Jharkhand, Rajasthan and Bihar were recognized for lower female education rate, lower than the national average (65.46 %). Desert conditions, hill terrain and extreme poverty and so forth were limits to the development of education and especially the female literacy rates in these particular states.

2.5 Regional Status:

Apart from reducing gender gap in literacy with a good improvement in literacy rate particularly in females showing faster progress compared to the males there is still a huge degree of variance which remained at around 16 percentage points in 2011 among males and females regarding the literacy rate [4].

Within the state, there are huge variations across districts in the literacy rate. The highest literacy rate West Godavari (74.6 per cent) districts. The lowest rate (55.0 per cent) has been observed in the Vizianagaram (58.9 per cent) and Kurnool (60 per cent) districts. There is thus a gap of 28 percentage points between the highest and the lowest literacy rates across districts in the state. An analysis of the literacy rate at the mandal² (sub-district) level shows that out of the total of 1128 mandals in the state of Andhra Pradesh, a majority of them (815 mandals comprising three-fourths of the total) have a literacy rate that is below the state average (67 per cent), according to the 2011 Census. About two-fifths of the mandals have a literacy rate in the range of 50-60 per cent and another two-fifths of them have a literacy rate of 60-70 percent. Very few mandals have a literacy rate above 80 per cent.

In the case of rural literacy rate, particularly rural females, there are around 10 mandals in the state that recorded female literacy rate below 30% in 2011. The fact is about half of the rural mandals recorded female literacy rate only 30-50%. Only these portions of mandals in the rural topography with less than 50% of female literacy are found to be offering more than 33% of total population in the state. This shows the critical position of female literacy in most of the mandals of the state.

As a policy implication it must be endeavored to achieve higher literacy rate (including female and general literacy) in underdeveloped and backward of India. Literate women will lead higher social advancement and higher economic development in India.

A robust STEM education creates critical thinkers, problem-solvers, and next generation innovators. Considering that India is one of the nations that produce the most elevated number of researchers and engineers;

IBM said it would prepare two lakh women in science, technology, engineering and math (STEM) abilities across India. The organization said that collaboration between IBM and Indian state governments is essential for a three-year program to build the participation of young girls and women in STEM careers. IBM consented to arrangements with states- Karnataka, Telangana and Andhra Pradesh and has plans to take this program to different states in the coming months.

Courtesy from <https://economictimes.indiatimes.com/tech/software/ibm-to-train-two-lakh-women-in-stem-skills-in-india/articleshow/68359449.cms>

2.6 Benefits from project to the state

Since ages women are playing vital role in household work. Presently women likewise perceive their career as well as engaged in various activities in addition to their domestic work. Forming a society without fear, insecurity, discrimination and exploitation for women must the forefront goal to ensure and build the better future for next generation.

Women today are breaking the barriers and are playing the dual role in managing the household as well as the professional life. The question of in science in India stands apart on account of the practically complete absence of research explicitly on women scientists. This is reasonable because having women doctors since a very long time in India is known but the fact of having women researchers and scientists is genuinely new different from the male scientists.

“Representation of women in all spheres is critical for success and growth and to maintain gender diversity and parity,” argues Dr Renu Swarup, Secretary, Department of Biotechnology, Government of India. (Courtesy from <https://researchmatters.in/news/nurturing-support-system-india%E2%80%99s-women-scientists>)

The DST presently has a division called 'Science for Equity, Empowerment and Development Division' (SEED). Different projects for women scientists by the DST (under the DISHA program) have been acquainted to give an empowering and supportive framework for gender mainstreaming of women in science, innovation and development.

2.6.1 In the state of Andhra Pradesh

The government of AP has introduced several schemes and funding policies to encourage women scientists in science, technology and research.

Award: Post Doctoral Fellowship to Women Candidates

To accelerate the talented instincts of the unemployed women candidates holding Ph.D. degree in their respective subject areas to carry out the advanced studies and research. The objective of this award is to provide an opportunity to carry out the advanced studies and research in science, engineering and technology, humanities and social sciences in Indian Universities and Colleges recognized under Section 2 (f) and fit to receive assistance under section 12(B) of the UGC Act 1956/Institutes of National Importance established by the Central/State Government.

DBT: Biotechnology Career Advancement and Re-orientation programme (BioCARE) for women Scientists.

To enhance the participation of Women Scientists in Biotechnology Research, the Department of Biotechnology launched a Biotechnology Career Advancement and Re-orientation Programme (Bio-CARE) for women Scientists. The purpose is to build capacities for women Scientists employed fulltime in Universities and small research laboratories or unemployed women Scientists' after a career break so as to help them undertake independent R&D projects.

Department of Health Research (DHR) –ICMR

It is a programme specifically for women: Short /Long term training in Indian institutes followed by fellowship to women candidates who have had a break in their career but having demonstrable aptitude towards health research in front line and emerging areas

Department of Science and Technology (DST)

The scheme is meant to encourage women in S&T domain, preferably those having a break in career and not having regular employment, to explore possibility of re-entry into the profession.

- Santoor Women’s Scholarship, offered by Wipro Consumer Care and Wipro Cares, provides financial assistance of INR 24,000 annually to girl students who have passed class 12 and wish to pursue higher education in the field of Humanities, Liberal Arts and Sciences. The scholarship is given to 900 girl students of Andhra Pradesh, Karnataka and Telangana.
- The Advanced Analytical Centre was established in the year 2009. The Centre was started in Andhra University since individual researchers may not be able to generate huge research funds for the research instruments. The centre is equipped with sophisticated instruments which help the faculty, research scholars and students to carry out globally competitive R & D in basic and applied sciences like Biological, Chemical, Physical, Pharmaceutical, Mathematical, Engineering & Earth sciences.
- The event, titled ‘She Builds Tech – Smart City Hackathon’, is being organised by the Girls in Tech Foundation, in association with the APSCHE, the Department of Youth Services, the Government of Andhra Pradesh, and the US Consulate General, Hyderabad, and supported by IBM and Wavelabs.
- The state gives benefits and incentives (monetary and nonfiscal) to support women entrepreneurship. Ladies business visionaries can use benefits under the Andhra Pradesh Information Technology (IT) strategy (2014 – 2020) as well as Industrial Development Policy (2015 – 2020).

Inception of Centre for Women's Studies:

The Centre for Women's Studies was established in Andhra University on 27th May, 1987 in accordance with the guidelines of the UGC to establish such Centres in Universities and colleges. The Centre was christened as Dr.Durgabai Deshmukh Centre for Women's Studies on **9th March, 2007**.

The primary role of the Centre is

- *Knowledge production, Knowledge assimilation and Knowledge transmission*

Since its inception, the Centre's activities have been in line with the following major thrust areas:

- Teaching and Training
- Research and Action Research
- Field Action
- Net working and mentoring
- Extension services
- Advocacy
- Cluster and Nodal activities
- Documentation and Dissemination

Chapter 3: DATA COLLECTION DESIGN

3.1 Introduction

The rate of women in science is less percentage to the total number of working women in India. The truth behind this fall in rate is scarcity of science fellowships, awards and position in science administration. The under representation of women in science especially at senior level in teaching and research has become a genuine concern. Therefore there is immediate need to create aware among women that choosing career in science is potential career-choice decision as well as retain them in the profession and provide necessary recognition. It is also necessary to change the mindsets of authorities and managerial bodies not to restrict but to encourage women towards science education considerably.

Women in India face several challenges in moving up the academic and administrative ladder due to systemic barriers and structural factors. While gender equality in science is in the spotlight, it is also considered as keen interest of scientific progress and society. Break in career is also one of the issues arises out of motherhood and family responsibilities form. To address such issues, Department of Science and Technology (DST) launched "Women Scientists Scheme (WOS)" during 2002-03. The primary goal of this initiative is to provide opportunities to women scientists and technologists (age 27-57) who had break in their career and looking forward to rejoin their desired mainstream.

3.2 Women Scientist Fellowships

This scheme encourages women to pursue research in science and engineering focusing on societal related problems. It also promotes women scientists to take up S&T based internships followed by self employment. Following three categories of fellowships, with research grants, are available for Indian citizen:

1. **Women Scientist Scheme-A(WOS-A):** Research in Basic/Applied Science
2. **Women Scientist Scheme-B (WOS-B):** S&T interventions for Societal Benefit
3. **Women Scientist Scheme-C (WOS-C):** Internship in Intellectual Property Rights (IPRs) for the Self-Employment

1. **Women Scientists Scheme-A (WOS-A)** provides platform to women scientists and technologists for pursuing research in basic or applied sciences in frontier areas of science and engineering. The scheme plays pivotal role in gender mainstreaming as it not only prevents brain drain from S&T system but also train and retain women in the system. The scheme initially offers opportunity to work as bench-level scientists and ultimately open new avenues for permanent position in Science & Technology.

2. **Women Scientist Scheme-B (WOS-B)** focuses on projects related to Science & Technology (S&T) interventions for societal benefit. Such project proposal should address a well-identified societal challenge and deliver possible solution(s) by way of development of viable technology/technique and/or lab-to-land technology transfer, its adaptation and scaling up. Women scientists who wish to apply under this scheme are required to develop their own project/proposals for scientific and technological solutions to address issues preferably at enhance quality-of-life the grassroots level. The proposal must clearly bring out the societal benefit to be accrued through well conceived plan for development of technology/technique and/or adaptation/customization. The candidate should have adequate S&T skills and be adept at techniques to deliver the proposed outcome.

3. **Women Scientist Scheme-C (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 in order to develop a pool of women scientists geared to creating, protecting and managing intellectual property in India. Hands-on training on different aspects of IPRs (e.g. patent search, know-how, drafting, filing, trademarks, trade secrets, copyright etc.) is major part of WOS-C curriculum in association with various Knowledge Partners (i.e. Law firms, Knowledge Processing Organizations (KPOs), Companies, Government agencies, and so on).

4. **DBT Bio-Care Programme** In an attempt to enhance the participation of Women Scientists in Biotechnology Research, the Department of Biotechnology launched a Biotechnology Career Advancement and Re-orientation Programme (BioCARE) for women scientists in January, 2011 and first call for applications was announced in the year 2011. The programme is mainly for Career Development of employed/ unemployed women Scientists upto 55 years of age for whom it is the first extramural research grant. The scheme is open for all areas of Life Science / biology

(including agriculture, veterinary science and medicine). Women Scientists who are employed or unemployed or are desirous of coming back after a break can get back to the main stream by getting their first grant as the Principal Investigator. (Women Scientist who have already availed any grant as a Principal Investigator from any Government Funding Agency are not eligible to apply).

5. **UGC-PDF programme** The UGC has initiated a scheme of Post-Doctoral Fellowship for Women to those candidates, who are unemployed holding Ph. D. degree in their respective subject areas with an aim to accelerate the talented instincts of the women candidates to carry out the advanced studies and research. The total duration of the fellowship is five years with no provision for further extension. The number of slots available under the scheme is 100 per year.

6. **Indo-U.S. Fellowship for Women in STEMM** The program provides opportunities to Indian Women Scientists, Engineers & Technologists to undertake international collaborative research in premier institutions in U.S.A, to enhance their research capacities and capabilities.

7. **Women Entrepreneur Quest (WEQ)** WEQ is a comprehensive platform that provides mentoring, learning and networking opportunities for real business growth. The objective of this competition is to encourage, promote and showcase technology start-ups, founded by women entrepreneurs. Top 10 winners of WEQ received an all-expenses-paid experiential learning visit to Silicon Valley, US and meetings with key stakeholders in the Silicon Valley ecosystem such as leading technology companies, startups, investors, officials, incubators, accelerators, universities and so on.

8. **S&T for Women** The program “Science and Technology for Women”, under KIRAN mandates to promote gender equality and empower women at grassroots level with inputs of S&T through development, adaptation, adoption, transfer, demonstration and replication of appropriate and successful technologies. Since inception, more than 2000 projects have been sponsored and more than 500 technologies developed.

9. ***Women Technology Parks*** These WTPs act as a single window hub for convergence of diversified technologies, leading to socio economic development of women through capacity building and adoption of location-specific technologies. Diverse technology areas like agriculture (including fisheries, animal husbandry, horticulture technologies), aromatic and medicinal plants, forestry, alternate livelihoods, Post harvest technologies, natural resource management, health & sanitation, occupational hazards, construction, energy, management of natural resources, rural development, rural industry, rural engineering, micro enterprise, sustainable agricultural practices etc. form the core areas of interventions for WTP.

10. ***Consolidation of University Research for Innovation and Excellence in Women (CURIE)*** CURIE was launched in 2009 to strengthen R&D infrastructure of women-only Universities. This unique model of support has led to significant increase in number of quality publications including papers in journals of repute by the faculty and researchers of beneficiary universities.

11. ***Vigyan Jyoti*** A dedicated program for girl students to pursue their careers in Science, Engineering and Technology. The programme aims to encourage and inspire girl students to pursue higher education and become self-reliant and also offers exposure for girl students coming from rural background to help understand how to plan their journey from school to college and thereafter from research to a job of their choice in the field of science.

3.3 Survey Questionnaire Design and Data collection

The research design developed acts as an interaction between surveyor and respondent. To be noted the analysis or findings are not pre-determined or pre-hypothesized rather the results are obtained from the data gathered.

Regional principal investigators of the team will be gathering the data using this questionnaire or by the personal meet with the respondents who have availed for these schemes. The questionnaire designed was distributed to the women scientists with an Authorization letter and Introductory note attached attested by the Government of India for the active support and cooperation of respondents with the investigating team.

The data collected through these questionnaires cover both objective observable parameters as well as a few subjective parameters related to perception and attitudes. A couple of queries concerning best practices were kept open-ended to get women scientist's input about policies that would be favorable for dual role management ensuring career continuity and promotion of women scientists in science and research. These parameters include:

- Personal Information
- Information on currently affiliated institution
- Pre-Project Condition of Women Scientist
- Projects Related Information
- Project wise information
- Information about Institution
- Mentor's information
- Status of the project
- Current job details
- Professional Development
- Skill development
- Programme feedback

The quantitative and qualitative variables of this questionnaire include

- Achievement indicators based on projects undertaken
- Number of papers published during the project
- Number of workshops/conferences attended/conducted
- Awards
- Career track details like
 - Experience in years
 - Before/During/Current working position
 - Promotions
- Education details

The questions on perception and attitude include

- Sense of achievement
- Extension or transfer of projects and the reasons behind
- Acceptability in workplace
- Motivation given by family and mentors
- Break in career and the reason behind
- Level of ambition

Workshop Organized:

A workshop on “Gender Mainstreaming Programme for Women in Science” was organized by Institute of Bioinformatics and Computational Biology (IBCB), Visakhapatnam, Andhra Pradesh on 20th August 2019 at Andhra University, Principal building Seminar hall, Visakhapatnam sponsored by NSTMIS Division, Dept. of Science & Technology, GOI, New Delhi.

- ❖ Aim of the workshop: To gather information of women working in science and research. Their contribution in research including challenges and problems faced for further improvement of schemes.
- ❖ To keep a legitimate record of women scientists which plays important role in making decisions to implement and execute policies for further improvement and promotion of women in science and research(S&T,R&D).

- ❖ During the workshop different aspects of implementation of various Government sponsored projects, present scenario of women in science and existing opportunities were also discussed.
- ❖ Dr. H. B. Singh (Scientist, Department of Science & Technology (DST), New Delhi), Dr. Allam Appa Rao (SDPS Fellow Chairman, NITTTR, Chennai) were invited to conduct the workshop.

Workshop was initiated with a formal inaugural session followed by interaction with women scientists. Overall 30 women scientists took part in the workshop consisting of those who had already enrolled in various schemes along with the one who want to get aware of schemes provided for further enrolling. These women who participated in the workshop are from Engineering and Science departments (PG and PhD). Women scientists has presented their research works ongoing and completed under the support of government. Challenges while carrying the project and their suggestions recommended were also discussed and taken into consideration for further improvement during the interaction.

Dr. H.B. Singh has immensely supported in answering the participants regarding government standards on the specific issues. Sir has contributed his precious time in discussing status of the various research schemes undertaken by government as well as further improvement of the schemes. Dr. Allam Appa Rao has emphasized on present scenario of science and research in Andhra Pradesh. Sir has discussed on research outputs of sponsored projects in terms of publications in quality journals, patent filing, authorship pattern etc. along with schemes, opportunities and important areas of science and research to be concentrated and worked upon.

It was decided to cover maximum number of participants under this project. Women scientists who have not completed the questionnaire, data were gathered from them by the project team with personal interaction. Authorized letter was sent to the respective institutions and organizations to cooperate in collection of data from those who are unwilling to provide their data, especially who got enrolled into DST, DBT and other schemes. Decision was made to incorporate the collected data to the national database. The project team has effectively contributed for the data collection from various respondents.

Apparently, the data collected for the study covers a span of (15th January 2019) prior to the date of survey (31st March 2021).

3.4 Data Collection

Initially the list of institutes were made from the official websites of ministries provided with category wise institutions, universities, research centers as approved under these ministries.

Participation of individual respondents was made voluntary based on both institutional consent and personal interest in response to invitations sent. A representative number of female respondents from each institute were interviewed through structured questionnaires depending upon their presence, availability and willingness to participate (senior, middle and entry level) in the survey.

As mentioned [3.3] the project team has forwarded the consent Introductory note, Authorization letter and structured questionnaire via mails to the women scientists as per the list of institutions/research centers/universities obtained. In case of failed mails or any issues aroused the team made efforts in making calls, meeting respondents personally or sending post/mail to their consent working institutes and managerial team to collect the data for the survey. The team also tried to establish contact over social media with respect to the concerned issues faced.

The goal of this study is to cover maximum women scientists as possible. If some respondents are unable to complete the questionnaire, they were approached personally or contacted via mobile to collect the data. It is also observed that women scientists who availed schemes other than DST are unwilling to provide their data. In such cases authorized letter is being sent to their working organizations for further proceedings accordingly without any intervention.

3.5 Institutional Presence of Women in Science: Secondary Data

For the detailed study of the state information regarding Andhra Pradesh including institutions, universities, research centers have been gathered from official websites of the State government as well as Nationwide to lay better foundation for the survey. Various census reports, articles, reports and status of STEM programs were also referred and studied in context to the development of career of women scientists.

3.6 Challenges

The survey initially was carried by the zone wise selection of states across India and then the list of respondents is gathered from categorized institutes who involved in DST or any government funded projects. To carry this survey an online form was finalized by the national coordinator in April 2019 which is to be filled by the women scientists. Some of the other practices included personal interviews with women scientists through phone calls, some by visiting institutes, conducting meetings, contacting heads of institutes etc, only some of the women scientists responded through it was possible to gather above 30% of data .This procedure couldn't be adopted because of

- a) Various professional and personal commitments the meetings have to be rescheduled several times and some have rejected after few scheduling.
- b) Some couldn't be traced at their contact details while some declined to participate.
- c) Even if some of them are willing to participate, could not participate as they are not approved by the institutional heads.
- d) Unwillingness to participate in the study is also a factor as observed.
- e) Major challenge is invalid addresses due to which many responses returned due
- f) The team found difficulty in authentication of report when most of the fields in questionnaire left unfilled or blank.

There are a few challenges, which are being discussed at the meetings and the issues are being addressed. So far all the PIs have attended 4 meetings. The 4th meeting with all the stakeholders from the Central Government Ministries, Departments and Regional PIs of the project entitled "Assessment of Government of India's Gender Mainstreaming Programs for Women in Science" was held on 20th February 2020 at 10:30 am at Administrative Staff College of India, New Delhi.

In the presentation National coordinator presented the relevance of the project, aim, objectives, project cycle, the methodology adopted, analytical tools and statistical tools to be used for the assessment and the current project statistics. The structural framework in tabular or matrix format has been designed for the responses received through online forms at the national level. Later this framework will be applied for assessing the impacts of the project at the 'Women in Science'.

It has been decided to capture the success stories of women scientists in different areas as well as different subjects. After in-depth discussion and deliberation held during the first phase of the meeting, the following decisions were taken:

- a. To track the beneficiaries, it was suggested referring 'Table 2 of the directory of Extramural R & D for Scheme-wise and Year wise information of the name and institution of the PI.'
- b. Suggested to send the e-mails to the beneficiaries through the support of respective Department Heads. Secondly, she advised mentioning in the e-mail to the beneficiaries that they will get a platform to present their work through the booklet for success stories with their photos in it.
- c. To change the data capture timeline, if there is no scope of getting the data of the starting years of the respective schemes.
- d. For arranging the appointment to the universities for collecting the project related information, suggested an email written to the universities with CC to the head of the fund granting Departments of GOI.
- e. To track the respondents by inclusion of various categories of institutes that is identified from official websites of government.
- f. To get a sufficient representation for each zone practically all the institutes accessible on official government sites were invited to participate in the study with a solicitation to send list of female respondents from the institution ready to take part in the study.
- g. Conducting workshops at reputed institutes of various categories from each zone followed by representative sample of respondents from each institute there by giving them platform to present their work individually.
- h. Contacting Head of the departments for the approval to respondents to participate in the study.

Chapter 4 ANALYSIS

4.1 Introduction

This chapter presents the insights of the analysis done about the data collected from the study regarding the women scientists. The analysis is focused at state level using simple descriptive statistics from the data gathered along with their distributions are presented.

Women scientist responses

Major variables of interest such as respondent profile in terms of age, marital status, number of children, highest degree held, nature of employment (job contract), nature of primary and additional work responsibilities, incidence and reasons for dropout or break in education, incidence and reasons for continuation and completion of education after break, incidence and reasons for break in employment, various achievement indicators with regard to professional recognition are all analyzed along with respondent's perception regarding effect of dual role on career attainment and on fulfillment of family and household responsibilities and perceptions regarding work environment.

Non Responses:

Most of the respondents who contributed in the study have faithfully responded to all the questions, while there are few who returned partially filled questionnaire. Additionally many of the respondents didn't even fill the questionnaire despite multiple reminders. This has ended up being a limitation.

Observation from data on respondent's views regarding best practices for retaining women in science both among currently working science professionals is presented in Chapter 5. The analysis is focused on state level. An exploratory analysis using simple descriptive statistics for the above variables along with their distributions are presented in the sections below.

4.2 Background study- Andhra Pradesh

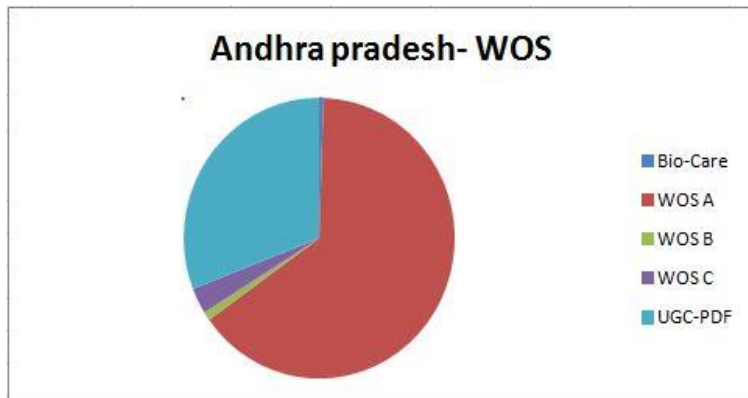


Figure 4.2: Analysis of WOS responses received

Table 4.2: Response Received from the WOS – Andhra Pradesh

Category	Andhra Pradesh	Received
Bio-Care	1	0
WOS A	130	96
WOS B	2	2
WOS C	6	2
UGC-PDF	62	12
Total	201	112
% of Respondents in total	55.72%	

From the Table 4.2, it is noticed that 55.72% of data collected for the state of Andhra Pradesh. Maximum responses received in the area of WOS B (100%) WOS A (73.07%) and WOS C (33.3%) followed by UGC-PDF (19.35%) and Bio-care (0%).

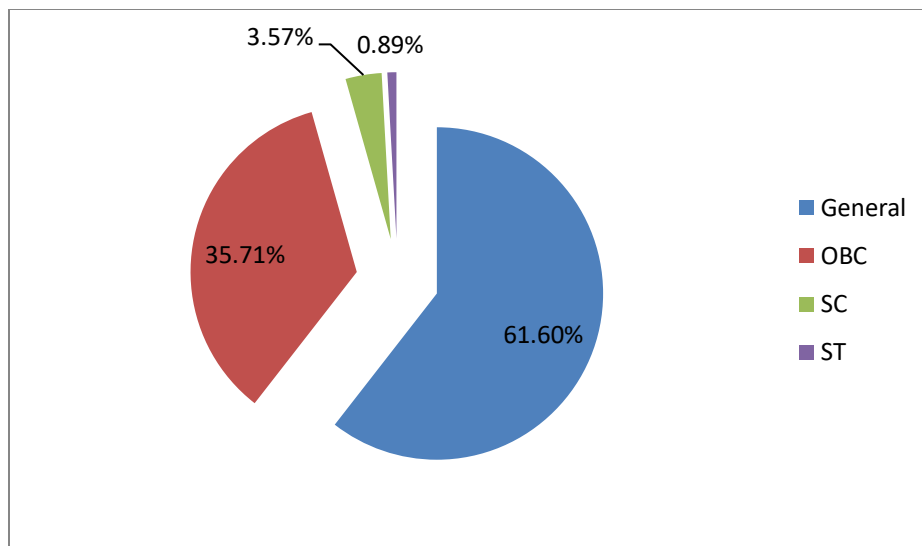


Figure 4.2 (a): Social group among currently working WOS in Science

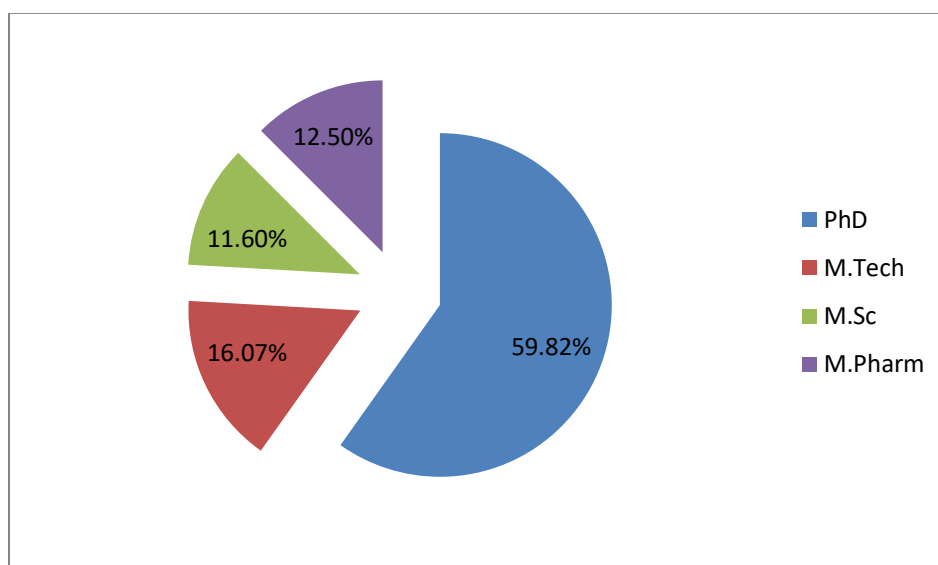


Figure 4.2 (b): Highest degree held by sampled WOS in Science

Figure 4.2 (a) reveals the social group of number of sampled WOS in Science the General category is the maximum with 67 (61.60%) followed by 40 (35.71%) OBC, 04 (3.57%) SC and 01 (0.89%) ST. PH is not having any representation.

Fig 4.2 (b) summarizes the distribution of working women in science across different academic degrees. 67 (59.82%) WOS have undertaken the projects who pursued Ph.D. followed by 18 (16.07%) in M.Tech., 13 (11.60%) in M.Sc. 14 (12.5%) in M.Pharm

4.3 Working Institutions in Andhra Pradesh

Table 4.3: List of Institutions where WOS are working in Andhra Pradesh

Institutions	WOS
Andhra University, Vishakapatnam	32
Jawaharlal Nehru Technological University, Kakinada	4
Sri Venkateswara University	13
KL University, Guntur	13
Lakireddy Bali Reddy College of Engineering, Krishna dist	9
Vasireddy Venkatadri Institute of Technology, Guntur	2
Shri Vishnu Engineering College for Women, Bhimavaram	8
Sri Padmavathi Mahila Visvavidyalayam, Tirupathi	2
Siddartha Educational Academy Group of Institutions, Tirupati	1
Madanapalle Institute of Technology & Science, Chittoor	2
KKR & KSR Institute of Technology & Sciences, Guntur	1
PACE Institute of Technology & Sciences, Ongole	3
Gandhi Institute of Technology and Management Institute of Science, Vishakapatnam	4
NTR College of Veterinary Science, Gannavaram	1
Aditya Engineering College, Kakinada	1
Acharya Nagarjuna University, Guntur	1
Koringa College of Pharmacy, Kakinada	1
Gayatri Vidya Parishad College of Engineering (Autonomous), Vishakapatnam	3
PR government college, Kakinada	1
Sri Krishna Chaithanya College of Pharmacy, Madanapalle	1
Vignan's Institute of Information Technology(A), Vishakapatnam	1
Anil neerukonda Institute of technology and sciences, Vishakapatnam	1

Dadi Institute of Engineering, Vishakapatnam	1
Institute of Bioinformatics and Computational Biology, Vishakapatnam	2
VS Lakshmi Women’s College, Kakinada	2
Raghu Engineering College, Bheemunipatnam	1
Swarnandhra College of Engineering & Technology, West Godavari	1
Total	112

From the Table 4.3, it is noticed that

- ❖ Collected data from 112 Women Scientists working in 27 institutions in Andhra Pradesh
- ❖ Maximum women scientists are involved in Andhra University followed by Venkateswara University, KL University and others.
- ❖ Only 55.72% are participated.

Out of 112 WOS sample it is identified that 70% of the sampled respondents in this group are reported to be “Married” and 30% reported as “Unmarried”. This shows that maximum of the women scientists especially from the state of Andhra Pradesh are successfully playing the dual role in managing the career in and household responsibilities even after the break in the career.

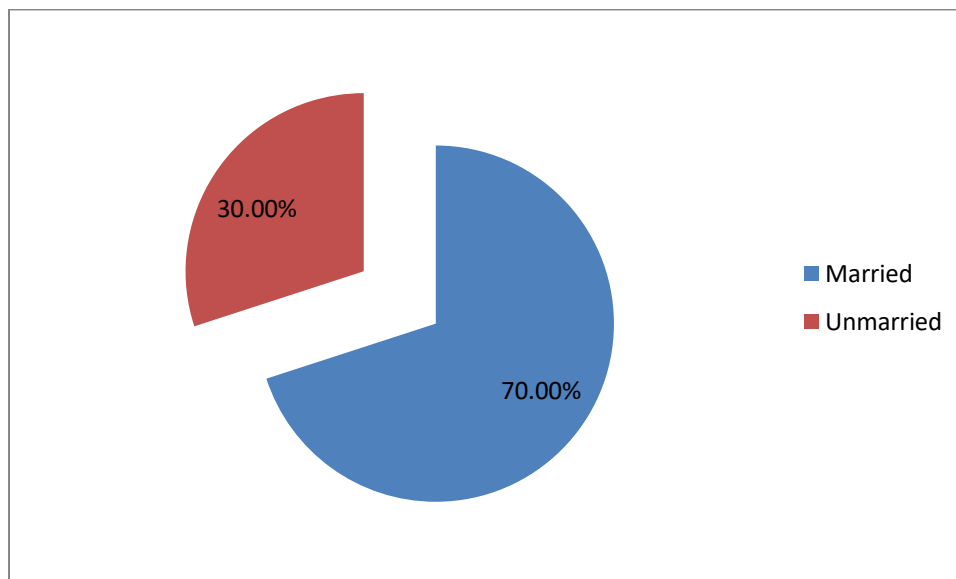


Figure 4.3 (a): Marital Status among sampled WOS in Science

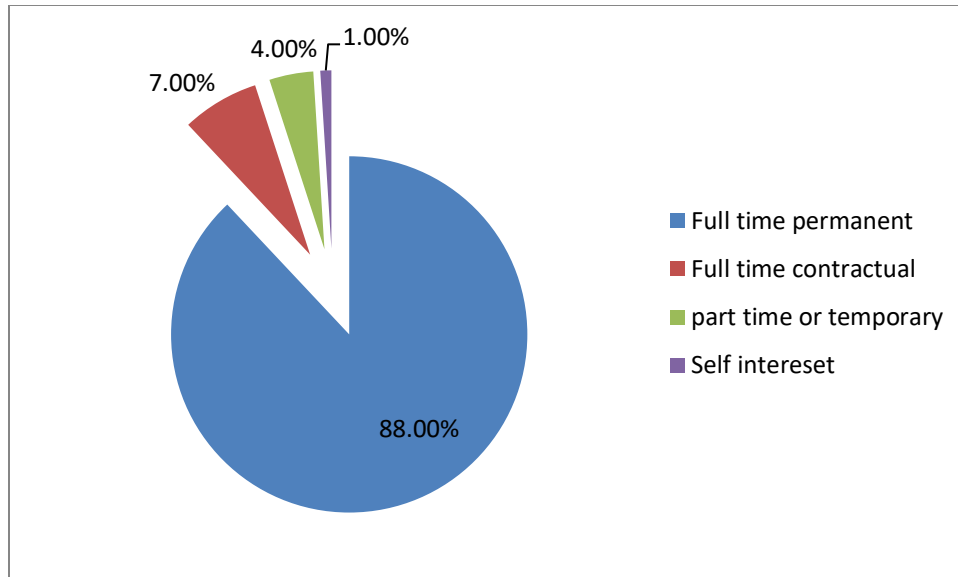


Figure 4.3 (b): Job contract type among sampled WOS in Science

When discussing the employment status 88% of the women secured professional jobs as Assistant or Associate professor along with some promoted to higher positions. Also it was identified from the personal review that there were no issues in continuing the career even after the break in career. 7% of them working in full time contractual jobs and 4% has part-time or temporary jobs and 1% relying on only the funding provided (doing project with self interest).

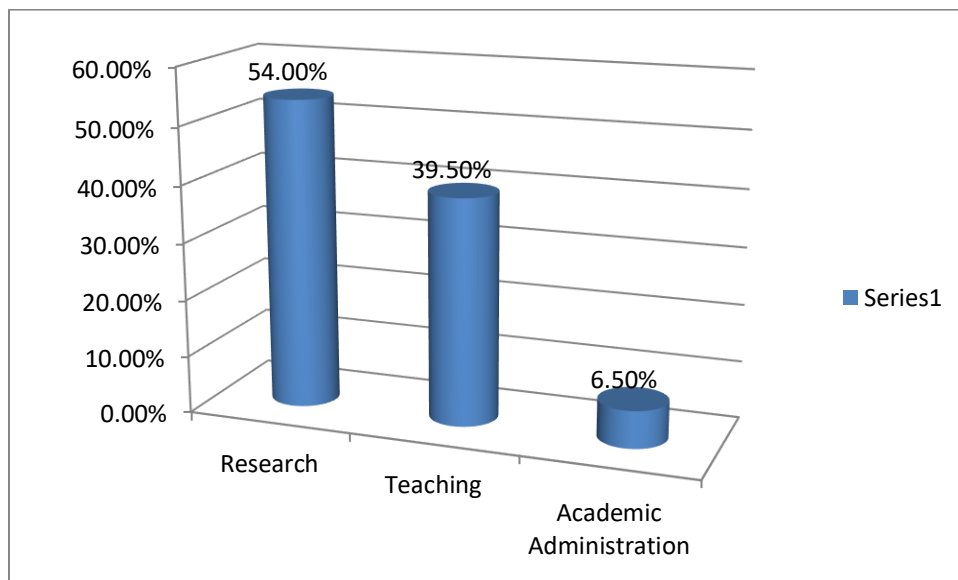


Figure 4.3 (c): Working type in current designation among sampled WOS in Science

For the sampled working women in science, research is the primary activity for most respondents (54%). Teaching and research support services are major responsibilities for 39.5% of working women respondents. Academic administration is major responsibility for 6.5% of sampled respondents with regard to the nature of work responsibilities reported that research is their additional responsibility. So while research emerges as primary responsibility, teaching and academic administrations are mostly additional responsibilities. This shows that women are showing progress in carrying the research for the personal and professional development as well. Also it is noted that most of the respondents have been working in the current designation more than 9 years or more.

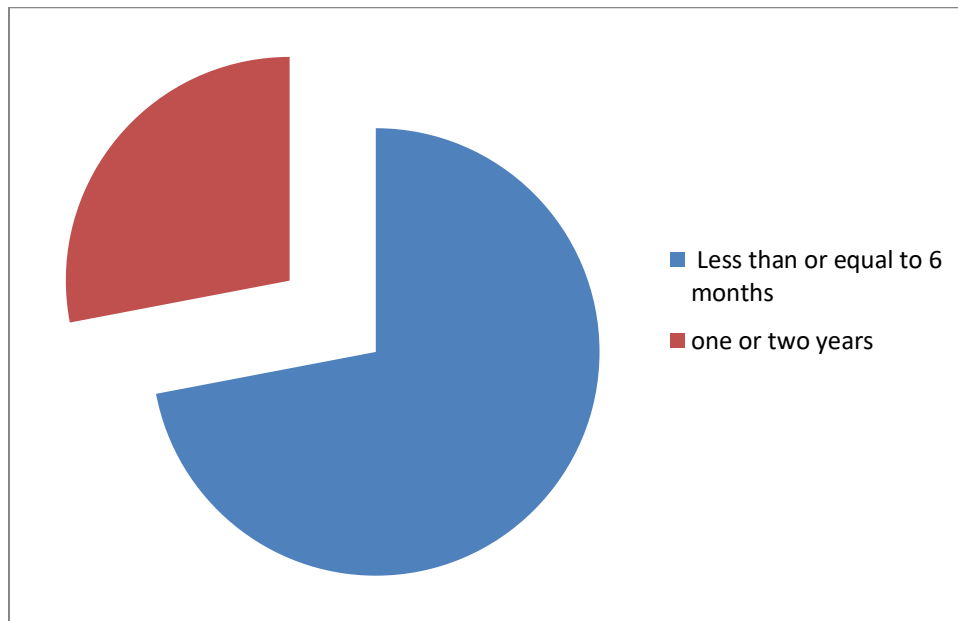


Figure 4.3 (d): Duration of break in career among sampled WOS in Science

Data was collected on the timing (with respect to higher education, marital and child birth status), duration and type of break for each break in employment for those working women who reported having a break in their career. Out of 112 respondents a clear majority of 72% reported that they do not have major break but less than 6 months only due to child birth. Specifically 28% of sampled working women reported that they had a break of one or two breaks in their career.

4.4 Inferences from analysis

Table 4.4.: List of Areas where WOS are working

Areas	WOS
Life Science	29
Biotechnology	4
Engineering Science	43
Chemical Science	11
Physical Science	6
Mathematical Science	6
Earth Science	5
Pharmaceutical	8
Total	112

From the Table 4.4, it is noticed that

- ❖ Maximum 43 (38.39%) WOS are working in Engineering Science followed by 29 (25.89%) in Life science, 11 (9.82%) in Chemical Sciences, 8 (7.14%) Pharmaceutical Science and others.
- ❖ WOS are interested to work in Engineering sciences in Andhra Pradesh.
- ❖ Earth Science and Physical Science are less preferred.

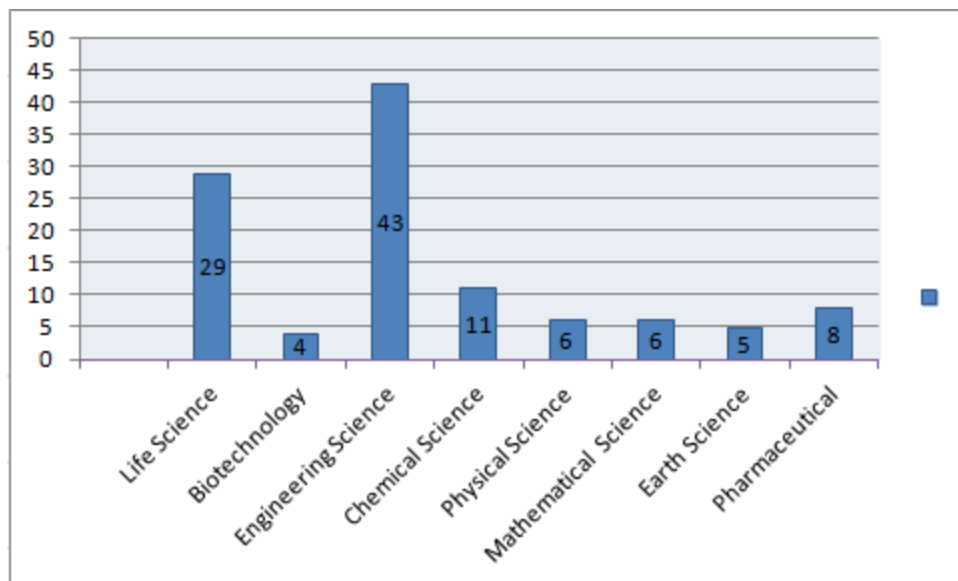


Figure 4.4: Distribution of Sampled Working Women in Science across Disciplines

Statistical Analysis:

Based on the samples collected chi- square test is performed to bring out the better observations from the analysis done and examine the relationship between statuses of the women scientists in Andhra Pradesh and the total samples received. From table 4.2 it is identified that the chi-square statistic is 17.322. The p-value is .001673 and the result is significant at $p < .05$. Observed calculations are represented as follows.

$$X^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}}$$

	Expected	Observed
Biocare	1 (1.28) [0.06]	0 (0.72) [0.11]
WOS A	130 (144.49) [1.45]	96 (80.51) [2.61]
WOS B	2 (2.57) [0.13]	2 (1.43) [0.23]
WOS C	6 (5.14) [0.14]	2 (2.86) [0.26]
UGC-PDF	62 (47.52) [4.41]	12 (26.48) [7.92]
Column Totals	201	112

Though $p = .001673$ is significant at 5% level the analysis shows that expected and observed frequency level do not match.

Hence forth the analysis of overall 112 sample women professionals in science has geared to implement strategies from the data collected on objective parameters influencing the environment of target group and design schemes based on the direct feedback of the respondents who are the primary beneficiaries of the policy. The specific limitations, recommendations and suggestions were discussed under broad categories in Chapter 5.

Chapter 5 RECOMMENDATIONS AND STRATEGIES

5.1 Introduction:

Women play vital role in workforce. Since earlier days women were playing dual role in managing profession, family and household work. However this has been inherently carried by women since ages and leading them to the crossroads despite the fact that they were able to manage even under pressure. Maximum of the well-qualified women scientists have left the S&T activities due to various reasons, where break in career is the significant fact with competing demands of time, effort and responsibilities. This way commitment to their career is likewise declining by seizing the opportunity of their career development. Thus this explains the gender gap at top-level management. Even if they want to revive their positions, it is not that easy due to restriction in age, qualification and experience criterion in the current system.

The vision report of women in science created by National Academy Sciences says that women are underrepresented all around the world in science and technology and features the requirement for schemes to promote the participation and contribution of women in science.

Department of Science and Technology (DST) launched "Women Scientists Scheme (WOS)" during 2002-03. The primary goal behind this initiative is to provide opportunities to women scientists and technologists between the age group of 27-57 who had break in their career and want to revive their profession. Through this undertaking of the Department, endeavors have been made to provide women constant support in scientific profession and help them rejoin in the mainstream along with additional benefits and facilities into the field of science and technology. However, those who are availing any temporary positions in research or academics may apply in the scheme but they have to leave their earlier assignment if WOS project approved.

To interact with women scientists apart from gathering details Department of Science and Technology in collaboration with IBCB have conducted symposium for identifying the problems behind carrying the projects, gathering their feedback and suggestions for the further improvement of beneficiary policies and promotion of women scientists in the state as well as in the nation.

Specific issues raised in analysis as a part of suggestions is discussed below:

5.2 SWOT Analysis

To know the specific issues and the feedback of the state women scientists, Department of Science and Technology, Govt. of India organized a various symposiums with the help of IBCB, Andhra Pradesh.

First and foremost the gap must be reduced as observed from the analysis- the expected and observed levels of WOS respondents does not match which might be due to several factors as mentioned in section 3.6 for which necessary steps need to be taken to reach the target level.

Overall thirty two scientists from different disciplines have come to participate in the events conducted in various universities as a part of symposium. Women scientists who already gave their feedback in the survey and the ones who haven't submitted yet also participated. After everyone filled the answers in questionnaire, we had an interaction session with each and every person followed by a group discussion and then a few speeches from women scientists. In group discussion, we discussed about how to encourage more women into science, their mindsets since childhood towards research and what makes them think more about research career from a young age.

Role of DST, Govt. of India was discussed in this programme and how Govt. helps women scientists by providing a strong platform to enhance their professional excellence. This leads to a strong message to the society that how women are managing both their families and professional activities in the society smoothly.

Importance of IPR was also discussed with the participants and provided solutions for the constraints faced by the participants for quality publication, patent filing and development standard and specifications of the products and process development. Some WOS were shared their works with the participants.

Dual Role:

Andhra Pradesh is taking all steps and creating the necessary facilities to stimulate scientific research and innovation to pave the way for the all-round development of the state. Many national important institutions were started which preferred not only by the WOS of Andhra pradesh, but also by the neighboring states like Telangana, Karnataka, Odisha etc.

Based on analysis carried, nearly 56% of WOS in Andhra Pradesh are successful in dual role by strengthening the society in Andhra Pradesh. Scientific research is not so dearer to SC&ST communities and occupied only 4% in participation of this programme.

Problems and Limitations:

Few women scientists share their views on issues and problems raised during the projects

- Out of 32 5% of women felt that they are being denied from having opportunity to attend conferences, receive travel alliances etc that would give them visibility.
- One woman scientist spoke about an incident: She bought an instrument costing around 6 lakhs and established in her department. The equipment has very good use for both students and staff to do their projects. In the final year of her project, the instrument had a repair and it costs around rupees 50,000/-. But since she doesn't have any amount left in the grant, neither the college sponsored, the project was impeded for many months.
- Faced problems in receiving grants on time during and while completion of the project.
- It was difficult to in accessing the facilities and equipment from other departments while doing the interdisciplinary research due to which it is leading to slow progress in the project as well as causing mental and physical stress during the course of the project. Outsourcing is not always preferred since it is too costly and extends the budget of the planned project.

5.3 Strategies and Solutions to be adopted for successful implementation by the stakeholders

– Government, Beneficiaries.

- The funding agency should also sponsor fund to maintain and repair the equipment whenever necessary for the period of 5 years after the purchase of it.
- There should be a proper transparent channel to release and spend the funds released.
- It will be good if DST assigns an official protocol of accessing other departments for official projects instead of having all the power with department heads. It will be best if DST cell itself regulates outsourcing to CSIR institutes and other government laboratories since they can be trusted. This can reduce the amount being spent and also improves quality of work and time.
- WOS are unaware of different IPR issues for their publications, patents and technology

aspects of the projects. DST instructions should be available for the authorship pattern. IPR Awareness Programme may be arranged regularly to achieve the goal.

5.4 General Discussions and Recommendations:

- Conscious or unconscious gender blindness is a problem which is rarely realized. Special efforts need to be made to guarantee that capable and competent women scientists must be encouraged to take part in conferences, must be given visibility and appoint them in decision making committees.
- Opportunities must be given to science teachers from universities/colleges in doing short term research projects by facilitating special leave with pay if they are planning for PhD.
- A web site must be designed having women scientists' directory with their professional profiles attached. This helps in identifying the speakers for conferences, arrangement of advisory groups, meetings etc.
- Transparency should be maintained while process of selection. Reasons for rejection should be recorded. Performance evaluation should be done on considering experience in profession rather than biological age.
- Career oriented sensitization and awareness must be created by conducting workshops, seminars and meetings in every region of the state and country, specially concentrating on schemes, scholarships, fellowships, funds etc provided in field of science and research.
- Conscious decision has to be taken in nominating more and more women by the scientific community in for fellowships, various positions in research organizations, institutions etc.
- S&T interventions and special drive on entrepreneurship are necessary to be conducted along with the government programs of health, education, nutrition, employment etc to promote livelihood, security of women.
- Flexible timings keeping in mind the dual role of women scientists while their contribution in the project would surely result in participation of maximum number of women in science, research and technology.
- Recruit gender-conscious peer review committees and speaker selection committees which help in increasing the promotion of female participation.

5.5 CURIE initiative of DST enhancing research facilities in women universities

Research facilities in 8 women universities have been enhanced with support from the CURIE (Consolidation of University Research for Innovation & Excellence in Women Universities) initiative of the Department of Science & Technology, (DST) Artificial Intelligence facilities have been set up in 6 women universities with support from the CURIE-AI facility initiative. The women universities have received total support of Rs 40 crore from the CURIE initiative started in the year 2008-09, and Rs. 4.20 crore from the CURIE-AI facility initiative started in the year 2019.

The Department of Science and Technology (DST) is implementing 'Knowledge Involvement in Research Advancement through Nurturing (KIRAN)' Scheme to provide various career opportunities for women scientists and technologists. It is primarily aimed to bring gender parity in the Science & Technology sector by inducting more women talent in the research & development domain through various programmes. CURIE & CURIE-AI facility of the Department under the KIRAN scheme, including other schemes, empowers women in science and technology.

In the year 2008-09, DST took a special initiative, 'CURIE,' to support women universities for improving R&D infrastructure and enhance research facilities. CURIE support has been extended to 08 Women Universities in the country namely Avinashilingam Women University, Coimbatore (Tamil Nadu), Banasthali University, Rajasthan, SNTD Women University, Mumbai (Maharashtra), Sri Padmavati Mahila Visvavidyalayam, Tirupati (Andhra Pradesh), Mother Teresa Women University, Kodaikanal (Tamil Nadu), Karnataka State Women University, Bijapur (Karnataka), Indira Gandhi Delhi Technical University for Women, Delhi (Delhi) and Rama Devi Women University, Bhubaneswar (Odisha). This year CURIE support is in the process to include 9th women university – Bhagat Phool Singh Mahila Vishwavidyalaya, Sonapat (Haryana).

CURIE support resulted in a significant increase of student enrolment at undergraduate, postgraduate, and Ph.D. levels in CURIE supported Universities. It has also enhanced the number of NET/GATE qualified students. Extramural funding has also been increased due to the presence of sophisticated labs, which resulted in publications in high impact factor journals.

In the year 2019, DST established an Artificial Intelligence lab in 6 CURIE beneficiary universities with the goal of fostering AI innovations and set up AI- friendly infrastructure to prepare skilled manpower for AI-based jobs in the future. This facility is exposing women students from these universities to different AI tools and will improve the employability of women in this upcoming sector.

Assessment of Government of India's Gender Mainstreaming – Data collected as per Curie questionnaire and attached at *Appendix 3*. We were able to collect only information from one respondent based one CURIE questionnaire as mentioned in the appendix.

Chapter 6 SUCCESS STORY

Following is the success story of one of the women scientists covered.

Dr. Archana Ayyagari, Department of Marine Living resources, Andhra University

Dr. Archana Ayyagari pursued her MSc in marine biology and pursuing PhD from Andhra University. She is currently working as Assistant professor in Andhra University in the department of Marine Living resources. She is married and mother of a child. Before being awarded with the project, I took a break for 5 years 3 months due to marriage and later because of child bearing. Followed by husbands posting in N.E Africa for six months and returned to India later. After returning I had to stay at home for taking care of child minimum for one year without any professional career. The ultimate goal of any Scientist is to make sure that his research is useful to mankind and it is my dream since my childhood to achieve this specific task in the frontier areas of Science.

After a gap of six years, I joined as a full time research scholar in the Andhra University, Visakhapatnam to fulfill my research goal. In the sequel, I came to know through one of my friend about the schemes especially offered by Department of Science and Technology to encourage the well-qualified women get left out of the Science & Technology activities due to various circumstances. Among the various schemes offered by DST to the women who have desires to return to mainstream, the WOS scheme-A has attracted me as it exactly suits my career graph and I thought that it would definitely help and support me to fulfill my dreams about pursuing the research career and achieve the goals. Immediately I prepared a proposal and sent to DST through the proper channel. The DST is kind enough to sanction the project with sufficient financial support to purchase the equipment and consumables to pursue the research work without any hindrances.

The project was on Studies on Biology and Bioactive compounds of sea urchins off Visakhapatnam Coast. The main and ultimate objective of the project has got Published a paper in the journal FOOD CHEMISTRY, which is an Elsevier Journal with an impact factor of 5.399 (Got 24 International Citations so far) under the title “**Nutrient composition and antioxidant activity of gonads of sea urchin *Stomopneustes variolaris*”**. I have conducted various skill development programs and attended various conferences which were informative and helpful in

project and career wise. During WOS-A, I have Learned various instrumentation techniques, Learned statistical tools (Conducted by DST), Paper presentation, paper writing and paper reviewing, GPS positioning

Impact of Fellowship/Internship of the scheme on

- Professional life

During the project I was able to secure profession of junior lecturer and this has helped me a lot in

- Knowledge sharing with the 10+2 Level CBSE students in Biology.
- The students can be motivated to carryout research in the field Science and technology.
- Creating awareness among the students about the steps taking by the Government of India to promote the research in the field of Science and the financial support extended by the Government through various talent search exams such as KVPY, NTSE.

- Family front

I have been always supported by the family and this helped me in securing job even after break. Also funding of the project helped me in having financial independence.

- Personal Front

- During the tenure of the project, I had the privilege to interact with the most eminent personalities in the field of Biology and its allied sciences.
- I came into contact with some of the renowned scientists and distinguished authors of both National and International. A few of them include Prof. Dr. D. B. James, Prof. Dr. Kathrivel Muthiah, Dr. R. Raghu Prakash, Dr. D. R. K. Sastry, Dr. Manohar, Dr Venkateswarlu, Dr. P. Mondal, Prof. Dr. J. S. Pearse and Prof. Dr. Simon Coppard. Their expertise, technical support and motivation have led me to achieve the objectives of the project successfully.
- Got the opportunity to review several research papers of most reputed international journals.
- Visited several Central Government organizations and CSIR Laboratories such as CMFRI and CIFT at Visakhapatnam, NBRI and CDRI at Lucknow, ICT-Hyderabad, National Institute of Fisheries Post Harvesting Technology & Training at

- Visakhapatnam. Got trained with latest technology and learnt several techniques to use the modern equipment available at those Institutes.
- Got trained for 2-weeks on “**Biochemical Analysis of Sea Food**” at Central Institute of Fisheries Technology, Visakhapatnam.
 - Attended various national and international conferences including workshops.
 - Learnt several Statistical Analysis tools-using Statistical packages by participating a work shop conducted by DST exclusively for Women Scientist Scheme (WOS-A) awardees at CR Rao Advanced Institute of Mathematics, Central University Hyderabad Campus, Hyderabad under the able guidance of Prof. Dr. Allam Appa Rao.
 - Become Life Member of various professional bodies.

The objective of the DST Women Scientist scheme is very great and there is no doubt that it has inspired me to take up the project and helped me to fulfill my dream to pursue the research career even after a career gap. I would like to conclude that I really enjoyed the fragrance of both academics and research during the tenure of the project and I would like to thank the Department of Science and Technology, New Delhi for providing me this great opportunity.

Chapter 7 CONCLUSION

Contribution of women in any field has been as commendable as men yet some way or other their contributions seem to be very little to be discussed or have been failed to remember with time. Gender equality is the most debated topic even in the 21st century which is true even in science and research. Most of the women scientists' contribution has faded and no one are unaware of their contributions in S&T. India is forward in making as much as efforts in discovering the unrecognized women scientists and those women who are conscious to give their strength and abilities in research by introducing various schemes, funds, awards etc for their development and promotion. A project was launched by DST, GOI to assess gender mainstreaming programs for women in science.

This study goes past the subject of presence and access of women in science and details on perceptions of women scientists regarding their career, education and research along with their perspectives on science and its value. Through keen observation from conducting interviews and respondent's participation, a collective report of the women scientists has been developed. The study was able to analyze the issues and concerns in the workplace environment as well as the institutional effect and causes. The analysis is focused at state level using simple descriptive statistics from the data gathered along with their distributions are presented. The following are the main aspects from analysis:

- Career orientation, priorities
- Research interests and projects undertaken
- Dual role in profession and family life
- Gender gap at workplace and research
- Perception of science and its value
- Achievements and awards
- Professional development
- Break in career and reasons behind

Apart from several issues occurred during the collection of data the study was successful and up to the mark in developing a report regarding the women scientists' access into science in the state done via personal interviews, conducting works

What is the output that emerges from study?

The study has made a significant contribution in listing the women scientists taking part in science and research in the state with an emphasis on issues in the scientific research. Two methodologies were undertaken for the data collection a) quantitative and qualitative variables b) Perception and attitude towards science and research. During the collection of data the challenges were discussed in regular meetings conducted to carry the study with ease.

Since the goal of this study is to bring maximum of the women scientists into the light contributing in the state. As expected, nearly 56% of WOS in Andhra Pradesh are successful in both scientific research and their family responsibilities to strengthening the society in Andhra Pradesh. Overall the study successfully portrays those Indian women as scientists and Indian scientists as women.

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Appendix 1**List of WOS of Andhra Pradesh**

Name	State	Marital Status	Category	Qualification	Institutions	Area
Ruthala Kalyani	Andhra Pradesh	Married	General	PhD	Andhra University	Life Sciences
Sirisolla Janaki Devi	Andhra Pradesh	Married	OBC	M.Pharm	Andhra University	Life Sciences
Balakrishnan Sri Lakshmi	Andhra Pradesh	Unmarried	General	PhD	Andhra University	Physical Sciences
Surisetty Padmaja	Andhra Pradesh	Married	OBC	M.tech	Andhra University	Life Sciences
Katti Aparna Durga	Andhra Pradesh	Married	General	PhD	Andhra University	Engineering Science
Nemani Bhagya Gayathri	Andhra Pradesh	Unmarried	General	PhD	Andhra University	Mathematical Science
Veeravarapu Hymavathi	Andhra Pradesh	Married	OBC	M.Pharm	Andhra University	Chemical Science
Ponnaganti Suneetha	Andhra Pradesh	Married	OBC	M.Tech	Andhra University	Earth Science
Anepu Sarada	Andhra Pradesh	Married	General	M.Pharm	Andhra University	Life Science
Srungarapu Chakri	Andhra Pradesh	Unmarried	OBC	PhD	Andhra University	Life Science
C. Kamakshi	Andhra Pradesh	Married	General	PhD	Andhra University	Chemical Science
Komboju Ambika Devi	Andhra Pradesh	Married	OBC	PhD	Andhra University	Life Science
Vaddiparthi Iswarya Deppthi	Andhra Pradesh	Married	General	PhD	Andhra University	Life Sciences
Thelagathoti Diana Conrad	Andhra Pradesh	Married	OBC	PhD	Andhra University	Life Sciences

Kadiri Sunanda Kumari	Andhra Pradesh	Married	OBC	PhD	Andhra University	Chemical Sciences
Ayyagari Archana	Andhra Pradesh	Married	General	PhD	Andhra University	Life Sciences
Manda Padma Sundari	Andhra Pradesh	Married	General	PhD	Andhra University	Chemical Sciences
Saramanda Geetha	Andhra Pradesh	Married	ST	PhD	Andhra University	Life Sciences
Kaparapu Jyothi	Andhra Pradesh	Married	SC	PhD	Andhra University	Life Sciences
Bhavani Boddeda	Andhra Pradesh	Unmarried	General	M.Pharm	Andhra University	Pharmaceutical
Vemuri Mlathi	Andhra Pradesh	Married	General	PhD	Andhra University	Earth Science
Bharathi Bidikar	Andhra Pradesh	Unmarried	General	M.tech	Andhra University	Engineering Science
K.Gayathri	Andhra Pradesh	Unmarried	OBC	M.Sc	Andhra University	Mathematical Science
Kalyani Riuthala	Andhra Pradesh	Married	General	PhD	Andhra University	Life Science
Chanamolu Swathi	Andhra Pradesh	Unmarried	OBC	M.Tech	Andhra University	Engineering Science
Kurre Purna Nagasree	Andhra Pradesh	Married	General	PhD	Andhra University	Chemical Science
Jayasri Loka	Andhra Pradesh	Unmarried	General	M.Sc	Andhra University	Life Sciences
Nagireddy Swarnalatha	Andhra Pradesh	Unmarried	OBC	M.Sc	Andhra University	Chemical Sciences
Prasanthi Thota	Andhra Pradesh	Unmarried	General	M.Sc	Andhra University	Chemical Sciences
P. Padmavathi Devi	Andhra	Married	OBC	PhD	Andhra University	Earth Sciences

	Pradesh					
T. Sai Devi	Andhra Pradesh	Married	General	PhD	Andhra University	Life Sciences
Alajangi Sujatha	Andhra Pradesh	Married	General	PhD	Andhra University	Life Sciences
C. Uma Maheshwari	Andhra Pradesh	Married	OBC	M.Tech	Sri Venkateswara University	Life Sciences
Motuku Usha Rani	Andhra Pradesh	Married	General	PhD	Sri Venkateswara University	Life Sciences
G B Hima Bindu	Andhra Pradesh	Married	General	M.Tech	Sri Venkateswara University	Engineering Science
Palagati Sucharitha	Andhra Pradesh	Married	General	M.Pharm	Sri Venkateswara University	Life Sciences
Purushotham Jyotheeswari	Andhra Pradesh	Married	OBC	M.Tech	Sri Venkateswara University	Engineering Science
Devadoss Devisasikala	Andhra Pradesh	Married	SC	M.Tech	Sri Venkateswara University	Engineering Science
K. Dhari Sree	Andhra Pradesh	Married	General	M.Tech	Sri Venkateswara University	Mathematical Science
S. Hemalatha	Andhra Pradesh	Married	General	M.Pharm	Sri Venkateswara University	Life Sciences
R. Gandhimathi	Andhra Pradesh	Unmarried	General	M.Sc	Sri Venkateswara University	Chemical Sciences
M.Suguna	Andhra Pradesh	Married	General	PhD	Sri Venkateswara University	Chemical Sciences
E.Mahanambal	Andhra Pradesh	Unmarried	OBC	M.Pharm	Sri Venkateswara University	Pharmaceutical
S.M.Shaheeda	Andhra Pradesh	Married	General	PhD	Sri Venkateswara University	Pharmaceutical
M.Dhana Lakshmi	Andhra Pradesh	Unmarried	OBC	M.Pharm	Sri Venkateswara University	Pharmaceutical

Pinapothu Satyaveni	Andhra Pradesh	Unmarried	General	M.Sc	VS Lakshmi Women's College	Life sciences
B.T. Lalithakumari	Andhra Pradesh	Unmarried	OBC	M.Sc	VS Lakshmi Women's College	Chemical Sciences
Marouthu Anusha	Andhra Pradesh	Married	General	PhD	KL University	Engineering Science
Chitra lekha	Andhra Pradesh	Unmarried	General	PhD	KL University	Life Science
Shaik Mahamuda	Andhra Pradesh	Married	General	PhD	KL University	Physical Science
Koneru Swapna	Andhra Pradesh	Married	General	PhD	KL University	Physical Science
Sri Kavya Chinnar	Andhra Pradesh	Married	OBC	PhD	KL University	Engineering Sciences
Nannapaneni Lavanya	Andhra Pradesh	Unmarried	General	M.Tech	KL University	Engineering Science
Madhavi Latha	Andhra Pradesh	Unmarried	OBC	PhD	KL University	Engineering Science
Nadella Krishna Jyothi	Andhra Pradesh	Married	General	PhD	KL University	Physical Science
Deevi Radha Rani	Andhra Pradesh	Unmarried	General	PhD	KL University	Engineering Sciences
R.Revathi	Andhra Pradesh	Unmarried	OBC	PhD	KL University	Engineering Sciences
K.Chandrika	Andhra Pradesh	Unmarried	General	PhD	KL University	Biotechnology
Shechinah Felice	Andhra Pradesh	Unmarried	General	PhD	KL University	Biotechnology
Swapna Guntupalli	Andhra Pradesh	Unmarried	OBC	PhD	KL University	Biotechnology
Gouthu Uma	Andhra	Married	General	PhD	Shri Vishnu Engineering College for Women	Earth Science

	Pradesh					
Madaka Sri Lakshmai	Andhra Pradesh	Married	OBC	M.Tech	Shri Vishnu Engineering College for Women	Engineering Sciences
Nrusimha Silpa	Andhra Pradesh	Married	OBC	M.Tech	Shri Vishnu Engineering College for Women	Engineering Sciences
S M Padmaja	Andhra Pradesh	Married	OBC	M.Tech	Shri Vishnu Engineering College for Women	Engineering Sciences
K. Padma Vasavi	Andhra Pradesh	Married	General	PhD	Shri Vishnu Engineering College for Women	Engineering Sciences
Nerella Archana	Andhra Pradesh	Unmarried	General	M.Pharm	Shri Vishnu Engineering College for Women	Life Sciences
S Sandhya Rani	Andhra Pradesh	Unmarried	General	M.Pharm	Shri Vishnu Engineering College for Women	Pharmaceuticals
Kondi Vanitha	Andhra Pradesh	Unmarried	OBC	M.Pharm	Shri Vishnu Engineering College for Women	Pharmaceuticals
K. Jhansirani	Andhra Pradesh	Unmarried	General	M.Sc	Swarnandhra College of Engineering & Technology	Physical Science
B. Hemlata Pralhad	Andhra Pradesh	Unmarried	OBC	PhD	Raghu Engineering College	Engineering Sciences
Uppada Rajya Lakshmi	Andhra Pradesh	Married	OBC	PhD	Jawaharlal Nehru Technological University	Engineering Sciences
P V S Lakshmi	Andhra Pradesh	Unmarried	General	M.Pharm	Jawaharlal Nehru Technological University	Biotechnology
Malla Lalitha	Andhra Pradesh	Unmarried	OBC	PhD	Jawaharlal Nehru Technological University	Pharmaceuticals
B.A.S Roopa Devi	Andhra Pradesh	Unmarried	General	PhD	Jawaharlal Nehru Technological University	Engineering Sciences
K.Lavanya	Andhra Pradesh	Unmarried	General	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
Niloufer Shaheeda	Andhra Pradesh	Married	General	PhD	Lakireddy Bali Reddy College of Engineering	Earth Sciences

S. Durga Sailaja	Andhra Pradesh	Unmarried	General	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
Kuduma Jhansi Rani	Andhra Pradesh	Married	General	PhD	Lakireddy Bali Reddy College of Engineering	Mathematical Sciences
Naidu Aruna	Andhra Pradesh	Married	General	PhD	Lakireddy Bali Reddy College of Engineering	Physical Science
M.Aruna	Andhra Pradesh	Unmarried	General	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
B.Shyamala	Andhra Pradesh	Unmarried	General	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
G. Vasundhara	Andhra Pradesh	Unmarried	General	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
M.R.L Jyotsna	Andhra Pradesh	Unmarried	OBC	PhD	Lakireddy Bali Reddy College of Engineering	Engineering Sciences
Doppalapudi Prasanthi	Andhra Pradesh	Married	General	M.Pharm	Sri Padmavathi Mahila Visvavidyalayam	Pharmaceuticals
Vennam Uma	Andhra Pradesh	Married	General	PhD	Sri Padmavathi Mahila Visvavidyalayam	Life Sciences
Jetti Karuna	Andhra Pradesh	Married	OBC	PhD	GITAM	Life Sciences
Boosi Shymala	Andhra Pradesh	Married	SC	PhD	GITAM	Engineering Sciences
Vaddadi Srivdevi	Andhra Pradesh	Married	General	PhD	GITAM	Engineering Sciences
Anjali Jha	Andhra Pradesh	Married	General	M.Sc	GITAM	Chemical Science
Gollapalli Jaganmai	Andhra Pradesh	Married	General	PhD	Acharya Nagarjuna University	Engineering Sciences
Cheepuru Kususma Kumari	Andhra Pradesh	Married	OBC	PhD	Gayatri Vidya Parishad College of Engineering	Engineering Sciences
Paluri V S Lakshmi Jagadamba	Andhra	Married	General	PhD	Gayatri Vidya Parishad College of	Engineering Sciences

	Pradesh				Engineering	
D.S Sharda	Andhra Pradesh	Married	General	PhD	Gayatri Vidya Parishad College of Engineering	Engineering Sciences
Alla kalavathi	Andhra Pradesh	Married	General	PhD	Vasireddy Venkatadri Institute of Technology	Engineering Science
Latha Gadepaka	Andhra Pradesh	Unmarried	General	M.Tech	Vasireddy Venkatadri Institute of Technology	Engineering Science
Konnipati Madhavi	Andhra Pradesh	Married	OBC	M.Sc	Madanapalle Institute of Technology & Science	Mathematical Science
S Jeelani Begum	Andhra Pradesh	Married	OBC	PhD	Madanapalle Institute of Technology & Science	Mathematical Science
Kaki Aruna Santhi	Andhra Pradesh	Married	SC	M.Tech	PACE Institute of Technology & Sciences	Engineering Science
Kakaraparthi Anusha	Andhra Pradesh	Married	General	M.Tech	PACE Institute of Technology & Sciences	Engineering Science
Raju Anitha	Andhra Pradesh	Unmarried	General	M.Tech	PACE Institute of Technology & Sciences	Engineering Science
Uppada Rajya Lakshmi	Andhra Pradesh	Married	OBC	PhD	Aditya Engineering College	Engineering Sciences
Aggala Naga Jyothi	Andhra Pradesh	Married	General	PhD	Vignan's Institute of Information Technology(A)	Engineering Sciences
Senkula Subha	Andhra Pradesh	Married	OBC	PhD	IBCB	Engineering Sciences
Desai Pooja	Andhra Pradesh	Married	General	M.Sc	IBCB	Engineering Sciences
Parvathini Rajya Lakshmi	Andhra Pradesh	Married	General	PhD	Anil Neerukonda Institute of technology and sciences	Engineering Sciences
Malla Lalitha	Andhra Pradesh	Married	OBC	M.Sc	Dadi Institute of Engineering	Engineering Sciences
Doppalapudi Prasanthi	Andhra Pradesh	Married	General	M.Pharm	Sri Krishna Chaithanya College of Pharmacy	Life Sciences

Chappidi Usha Rani	Andhra Pradesh	Married	OBC	PhD	PR government college	Life Sciences
Boddeda Bhavani	Andhra Pradesh	Married	OBC	PhD	Koringa College of Pharmacy	Life Sciences
Jahan Afroz	Andhra Pradesh	Unmarried	OBC	PhD	NTR College of Veterinary Science	Life Sciences
Musunuru Prathyusha	Andhra Pradesh	Married	General	M.Tech	KKR & KSR Institute of Technology & Sciences	Engineering Sciences
V.Madhusmitha Rani	Andhra Pradesh	Married	General	M.Sc	Siddartha Educational Academy Group of Institutions	Life Sciences

Appendix 2

ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMMES FOR WOMEN IN SCIENCE

(Department of Science and Technology, Government of India Sponsored Research Project)

CURIE QUESTIONNAIRE

INSTRUCTIONS to Fill the Form (on-Line/ hard Copy):

1. Before starting to fill the form, you may have a through look to the entire questionnaire.
2. You may keep all the details/documents of the projects you have undertaken, or is currently on-going.
3. Please select the suitable check-box for answering the questions.
4. Certain questions are descriptive. You may answer in the space provided. Please share your own views.
5. You are requested to add extra rows if required.
6. Please do not submit the incomplete form. You may go through the filled form once again before submitting.
7. The correct information and your positive support will bring accurate meaning to the project objectives.
8. On submission of complete information and correct information, the DST will give you a Certificate of 'Women Scientist Volunteer'.

Hoping to have your positive support.

Thanking you in anticipation.

PROJECT TEAM

Interviewer's Details:				
Name of the Interviewer:				
Designation:				
Email ID:				
Phone no./ Mobile No.:				
1. Respondent Details:				
Name of the Respondent:		Dr. Vennam Uma		
Designation:		Professor, Dept. of Social work		
Email ID:		umavennam@gmail.com vcspmvv@yahoo.com		
Phone no./ Mobile No.:		0877-2249131		
2. University Details:				
Name of the University:		Sri Padmavati Viswavidyalayam, Tirupati, Andhra Pradesh		
Address of the University:		Sri Padmavati Viswavidyalayam near West Railway Station, SVU Staff Colony, Padmavathi Nagar, Tirupati, Andhra Pradesh 517502		
City:		Tirupati		
State:		Andhra Pradesh		
URL:		spmvv.ac.in		
Year of Establishment:		1983		
NAAC Accreditation Status: (Year):		Till 9/15/2021		
CURIE Phase Awarded:		1 st Phase Year	2 nd Phase Year:2017	3 rd Phase Year:
2.1 Status of the Institution/University/College				
Academic Status		Autonomous Institute	University	Deemed University
		Affiliated College	Autonomous College	Constituent College
3. Details of CURIE Grants Received				
Phase	Awarded Year	Total Grant Awarded (Rs.)	Total amount Utilized (Rs.)	Status: On-going/ Completed
2 nd	2017	30,69,32,877/-	29,09,85,857/- (received)	Completed

4. Academic Programs added after receiving the CURIE funds (UG & Above)						
Phase	Departments – Wise	Newly Added Programs (Title)	Field of Specialization	Degree Awarded	No of Students In-take	Year
5. Diploma/ Certificate Programs added after receiving the CURIE funds						
Phase	Departments – Wise	Newly Added Programs (Title)	Field of Specialization	No of Students In-take	Year	
6. Conferences held after receiving the CURIE Grant						
Phase	Department-wise	No. of Conferences			Year	

7. Status on Placement due to CURIE Support

Phase	Department-wise	Year	No. of students in- take	No of Placement

8. Department Wise Sponsored R & D during CURIE

Department- wise	Name of the PI/Co-PI	Contact Details		Project		Field Specialization	Funding Agency
		Mob no.	Email Id	Title	Year of Sanction		

AUTHORIZATION LETTER



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DST/NSTMIS/05/211/2016-17

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग
नई दिल्ली-110 016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
TECHNOLOGY BHAVAN, NEW MEHRAULI ROAD
NEW DELHI-110 016

22-04-2019

TO WHOMSOEVER IT MAY CONCERN

(Subject: Assessment of Government of India's Gender Mainstreaming Programs for Women in Science)

The National Science and Technology Management Information System (NSTMIS), Department of Science and Technology (DST), Ministry of Science and Technology, Government of India has sponsored the above study to 13 Regional Principal Investigators (Dr Anjana Vyas, CEPT University, Ahmedabad; Dr Bharathi Salimath, University of Mysore, Mysore; Dr Maninder Kaur, Panjab University, Chandigarh; Dr Archana Reddy, SR College of Engineering, Warangal; Dr Vimmi Malhotra, Dronacharya College of Engineering, Gurugram; Dr S Sophia, Srikrishna College of Engineering and Technology (SKCET), Coimbatore; Dr Satheesh, Institute of Bioinformatics and Computational Biology (IBCB), Visakhapatnam; Dr Ekta Menghani, JECRC University, Jaipur; Dr Geetha, Kerala State S&T Council, Thiruvananthapuram; Dr N Jyotsna, KVK, Hengbung, Kongponki District, Manipur; Dr HM Padhy, Sophitorium College of Engineering, Jatni, Khurda; Dr Tanuja Singh, TPS College, Patna) with Prof. Anjana Vyas as the Chief Coordinator of the program.

As implementation of the Women - centric programs of the country are more than a decade and a half now, getting an insight into the success of the Schemes will help to understand further needs and improvements to the Schemes. It is appropriate at this time to evaluate the impact generated by the Schemes for a larger interest of Science and Technology promotional aspect in the country.

Regional Principal Investigators of the team will be collecting the data for this study, by means of questionnaire and/or personal visit to the candidates who have availed these Schemes. For this purpose, regional Principal Investigators will be visiting various organizations of the country.

The findings of this study will have high impact and will be of immense use to the Government to formulate appropriate strategies and measures to improve the quality of scientific career of stake holders, besides generating skilled human resources.

Your kind cooperation in providing a **prompt response** to the survey team will be highly appreciated for a meaningful and timely completion of this study.

We solicit your support and cooperation to the investigating teams in this endeavour of national importance.

(Dr HB Singh)
Scientist, CHORD Division

Appendix 4

ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING PROGRAMS FOR WOMEN IN SCIENCE

**(Department of Science and Technology, Government of India Sponsored Research
Project)**

Dear Woman Scientist,

Having administered large number of funding schemes and programs time-to-time, it is impossible for the Government of India to measure and trace the impact merely based on the data submitted by the individual Women Scientists or respective organizations at the end of the completion of the project and consecutive funding support. Since, the nature of support is targeted toward overall professional development; the resulting impact can only be determined by tracking individual's progress over period of time. Therefore, in order to evaluate impact of these schemes and programmes of the Government of India is conducting a survey and adjudge the core aim of the government is accomplished.

You are requested to participate in this questionnaire survey and fill the Form. The Survey Forms are prepared hard copy as well as on-line. You may spare your time and provide correct information. Please fill the form and give complete information.

We assure you that the information provided by you will be kept with DST, Government of India and will remain confidential.

Anticipating your kind co-operation.

Thanking you,

PROJECT TEAM

**ASSESSMENT OF GOVERNMENT OF INDIA'S GENDER MAINSTREAMING
PROGRAMMS FOR WOMEN IN SCIENCE
(Department of Science and Technology, Government of India Sponsored Research
Project)**

INSTRUCTIONS to Fill the Form (on-Line/ hard Copy):

1. Before starting to fill the form, you may have a through look to the entire questionnaire.
2. You may keep all the details/documents of the projects you have undertaken, or is currently on-going.
3. Please select the suitable check-box for answering the questions.
4. Certain questions are descriptive. You may answer in the space provided. Please share your own views.
5. Where ever Codes are assigned, you may select an appropriate Code and write in proper space given. For hard copy Survey Form the codes are available Annexures -1, Annexures -2, and Annexures 3. Wherein, in on-line Form you may have to select from the pull-down menu.
6. You are requested to fill the information for all projects you have undertaken from these schemes.
7. Please do not submit the incomplete form. You may go through the filled form once again before submitting.
8. The correct information and your positive support will bring accurate meaning to the project objectives.
9. On submission of complete information and correct information, the DST will give you a Certificate of 'Women Scientist Volunteer'.

Hoping to have your positive support.

Thanking you in anticipation.

PROJECT TEAM

Annexure -1: Accreditation Institutes

Institute's Code	Accreditation Institute's
001AICTE	All India Council for Technical Education)
002AIMA	All India Management Association)
003AIU	Association of India Universities)
004AKADOEACC	Department of Electronics and accreditation of Computer Courses)
005BCI	Bar Council of India)
006DCI	Dental Council of India)
007DEC	Distance Education Council)
008FTII	National and Television Institute of India)
009ICAI	Institute of Chartered Accountants of India)
010ICSI	Institute of company Secretaries of India)
011INC	Indian Nursing Council)
012MCI	Medical Council of India)
013NAAC	National Assessment and Accreditation Council)
014NBA	National Board of Accreditation)
015NCHRH	National Council for Human Resource in Health)
016NCTE	National Council for Teacher Education)
017NIELIT	National Institute of Electronics & Information Technology)
018NIRF	National Institutional Ranking Framework)
019PCI	Pharmacy Council of India)
020UGC	University Grants Commission)
021VCI	Veterinary Council of India)

Annexure -2: On Schemes

Code	Schemes
001BC	Bio-Care
002CU	CURIE
003MO	Mobility
00STW	S&T Women
005UGCPDF	UGC Post-Doctoral Fellow
006WSTEM	Women In STEM
007WOSA	WOS (A)
008WOSB	WOS (B)
009WOSC	WOS (C)
010WTP	WTP

Annexure -3: Field of Specialization

Code	Field of Specialization
001AAS	Agriculture and Allied Sciences (AAS)
002AS	Atmospheric Sciences
003CS	Chemical Sciences
004ES	Earth Sciences
005ETD	Engineering and Technology Development (ETD)
006ES	Engineering Sciences
007HFN	Health, Food and Nutrition (HFN)
008LS	Life Sciences
009MS	Mathematical Sciences
010PS	Physical Sciences
011OT	Other

Appendix 5

Women Scientist Symposium-I Report

Venue: Sri Venkateswara University, Tirupati

Date: 12th July, 2019

Host: Dr. P Satheesh, Principal Investigator in Andhra Pradesh

Event Title: Assessment of Government of India's Gender Mainstreaming program for women in Science.

Guests: Women Scientists available from Tirupati, Chittoor, Kurnool, and Kadapa were invited to participate in the symposium.

Agenda of the Symposium:

- To interact with women scientists and let them participate in filling the questionnaire.
- To identify their views on the current available women scientist schemes.
- To discuss various problems faced by women
- How to guide young passionate students and researchers to achieve their goals

Sessions:

- 10:00 AM to 10:15 AM- Introductory session
- 10:15 AM to 11:30 AM- Answering the questionnaire and personal interaction
- 11:30 AM to 12:15 PM- Group Discussion
- 12:15 PM to 01:30 PM- Speeches and End note.

Report Summary:

Nine women scientists from different disciplines have come to Sri Venkateswara University, Tirupati to participate in the event. Women scientists who already gave their feedback in the survey and the ones who haven't submitted yet also participated. After everyone filled the answers in questionnaire, we had an interaction session with each and every person followed by

a group discussion and then a few speeches from women scientists. In group discussion, we discussed about how to encourage more women into science, their mindsets since childhood towards research and what makes them think more about research career from a young age.

Women Scientist Symposium-II Report

Venue: Acharya Nagarjuna University, Guntur

Date: 9th August, 2019

Host: Dr. P Satheesh, Principal Investigator in Andhra Pradesh

Event Title: Assessment of Government of India's Gender Mainstreaming program for women in Science.

Guests: Women Scientists available from Vijayawada, Guntur, Bhimavaram, Ongole, and Mylavaram were invited to participate in the symposium.

Agenda of the Symposium:

- To interact with women scientists and let them participate in filling the questionnaire.
- To identify their views on the current available women scientist schemes.
- To discuss various problems faced by women
- How to guide young passionate students and researchers to achieve their goals

Sessions:

10:00 AM to 10:15 AM- Introductory session

10:15 AM to 11:30 AM- Answering the questionnaire and personal interaction

11:30 AM to 12:15 PM- Group Discussion

12:15 PM to 01:30 PM- Speeches and End note.

Report Summary:

Twelve women scientists from different disciplines have come to Acharya Nagarjuna University, Guntur to participate in the event. Women scientists who already gave their feedback in the survey and the ones who haven't submitted yet also participated. After everyone filled the answers in questionnaire, we had an interaction session with each and every person followed by a group discussion and then a few speeches from women scientists. In group discussion, we discussed about how to encourage more women into science, their mindsets since childhood towards research and what makes them think more about research career from a young age.

Women Scientist Symposium-III Report

Venue: Jawaharlal Nehru Technological University, Kakinada

Date: 16th September, 2019

Host: Dr. P Sathesh, Principal Investigator in Andhra Pradesh

Event Title: Assessment of Government of India's Gender Mainstreaming program for women in Science.

Guests: Women Scientists available from Visakhapatnam, Srikakulam, Vizianagaram, Kakinada and Rajahmundry were invited to participate in the symposium.

Agenda of the Symposium:

- To interact with women scientists and let them participate in filling the questionnaire.
- To identify their views on the current available women scientist schemes.
- To discuss various problems faced by women
- How to guide young passionate students and researchers to achieve their goals

Sessions:

- 10:00 AM to 10:15 AM- Introductory session
- 10:15 AM to 11:30 AM- Answering the questionnaire and personal interaction
- 11:30 AM to 12:15 PM- Group Discussion
- 12:15 PM to 01:30 PM- Speeches and End note.

Report Summary:

Eleven women scientists from different disciplines have come to JNTU, Kakinada to participate in the event. Women scientists who already gave their feedback in the survey and the ones who haven't submitted yet also participated. After everyone filled the answers in questionnaire, we had an interaction session with each and every person followed by a group discussion and then a few speeches from women scientists. In group discussion, we discussed about how to encourage more women into science, their mindsets since childhood towards research and what makes them think more about research career from a young age.